

# IOWA

STATE PLANNING BOARD

september  
1934

A REPORT OF PROGRESS



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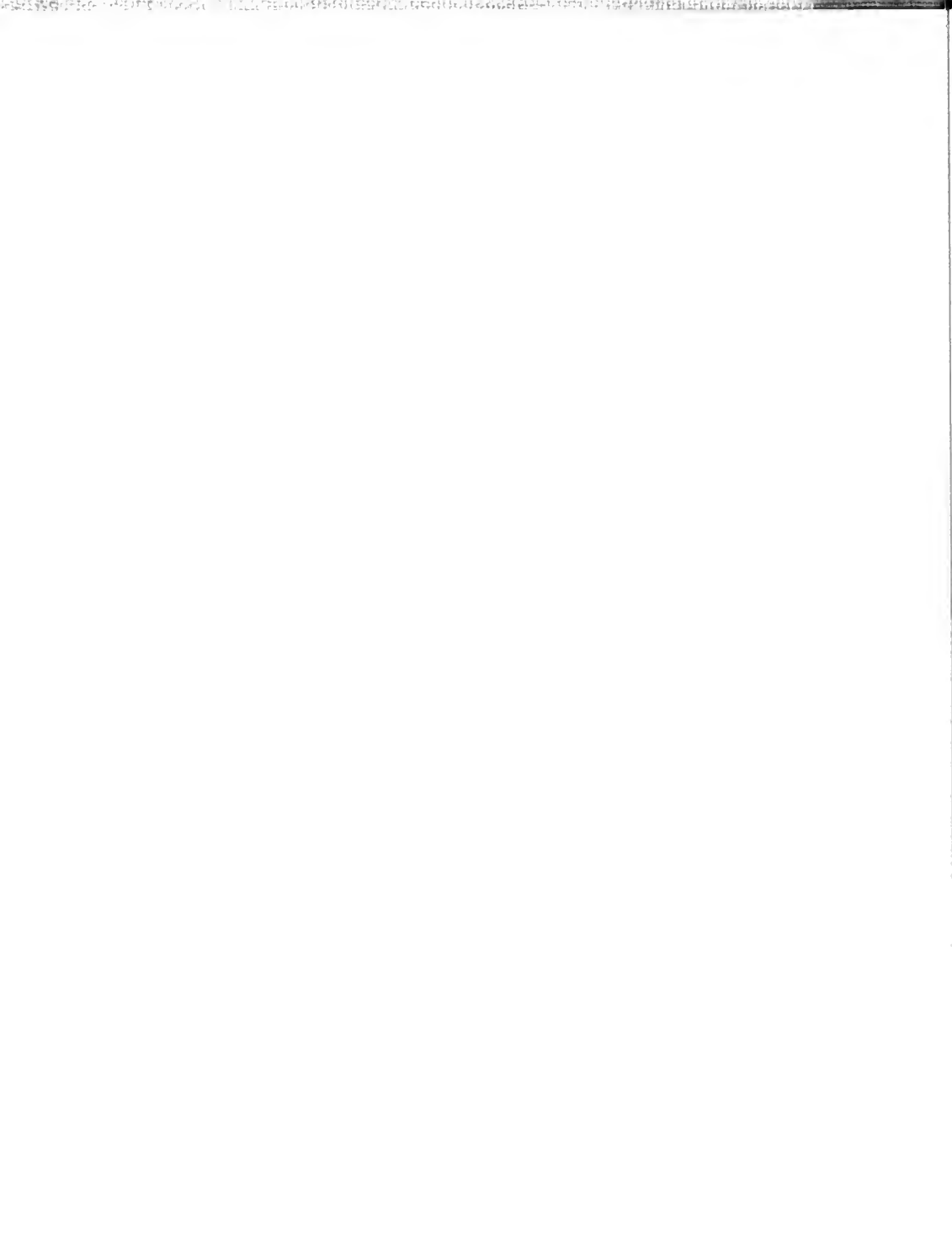


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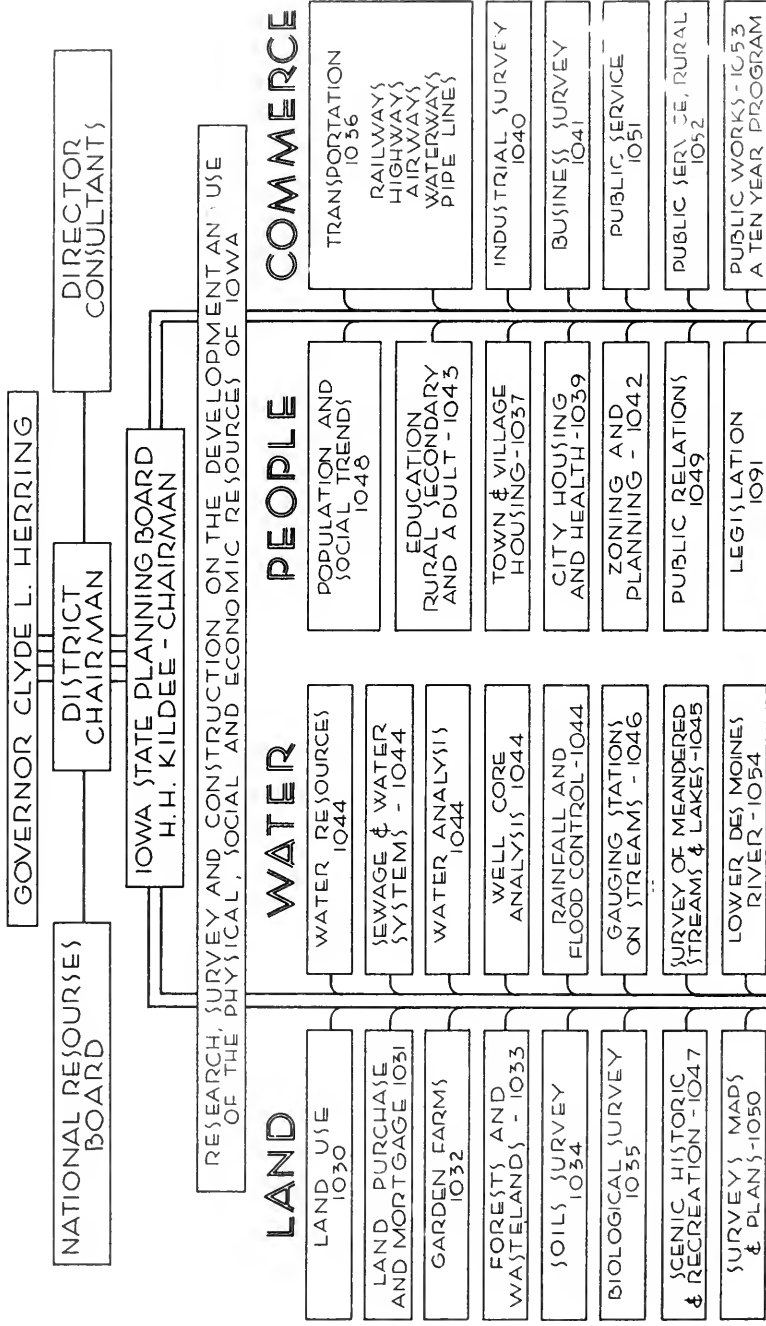








• IOWA STATE PLANNING BOARD •  
PROJECT CHART  
SEPTEMBER 1934



PLANNING A BETTER IOWA

IOWA STATE PLANNING BOARD



A PRELIMINARY REPORT  
OF  
PROGRESS

SUBMITTED TO THE  
NATIONAL RESOURCES BOARD  
WASHINGTON D.C.

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This report and the work it represents have been made possible through the cooperative efforts of many departments and institutions of the State of Iowa and by the support of C. W. A. and F. E. R. A. officials.

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## FOREWORD

Planning in Iowa is not new. Prior to the appointment by Governor Herring of the present State Planning Board, considerable work along that line already had been accomplished. Notable among the planning achievements was the Iowa Conservation Plan published in 1933. Though originally conceived largely as a research study and a general outline of the various phases of recreation, including state parks, fish, game and waterfowl refuges and havens, this plan finally developed into a broad and comprehensive program of conservation of the state's great resources in land and water.

When the great opportunity came through the Civilian Conservation Corps in 1933, the Landscape Architect, the Chief Engineer of the Board of Conservation and the Engineer for the Fish and Game Commission, were prepared. Their plans were at hand and no time was lost in getting the construction under way. In one year some phases of the twenty-five year program had been advanced to a degree equivalent to ten years of normal growth and development. This experience is a practical demonstration that, "It Pays to Plan".

An unusual amount of research and study along other lines of planning has been accomplished in the state, the results of which appear in various publications. Space and occasion permit mention of but a few. Prominent in any list would be "The Book of Iowa", Iowa's Industrial Survey published in 1932, the Brookings Institute report, publications of the State Historic

and Archeological Society, many Iowa Studies in Business published by the Bureau of Business Research at the State University of Iowa, as well as many bulletins on various phases of Agriculture, Farmstead Development, Engineering and other studies carried on at the Iowa State College and the Agricultural Experiment Station.

Because of this mass of material already available, it is not necessary here to recount the rich geologic, agricultural, industrial and social composition and resources of the state. Various individual project reports furnish the necessary summaries of the fundamental facts pertinent to each subject under consideration.

#### THE MAIN OBJECTIVES

We are embarking on a program of planning - planning the ultimate and most effective use of the land and water resources of the state in the interests of the people of Iowa and the nation.

Through such a program we hope to eliminate the appalling abuses of the past - the mining of our soil, the depletion of our forests and the neglect of our rivers, streams and lakes - and the resulting losses to the people because of them.

Iowans are becoming planning minded. They are justly proud of their great state, one of the richest agricultural producing areas on earth. They cherish it and should be eager to fall into line in a united effort to plan for its wise use, protection and development. One of the encouraging experiences of the Iowa State Planning Board is the widespread and intense

interest expressed by authorities and experts in each and every phase of its many sided activities. Every field of research, planning and engineering undertaken by the Board has enjoyed the fullest support from the leading minds in each branch of effort.

In common with other states in the fertile valley of the Mississippi, Iowa shows ample evidence of lack of planning in the past. Her forests have been largely cut; her towns and cities have grown in a most uneconomic and unattractive manner; her land has been allowed to erode seriously, filling and choking streams and rivers. With all this has come hardship and even want, to the very descendants of the sturdy pioneers who first settled in the state, subdued the Indians and unwittingly began these processes of waste and destruction.

In that region of the state which was first settled by white men, we find today one of the major problem areas, a region of wasted acres and a large number of "existence" farmers. Industry here, once thriving, has long since ceased to exist. Here, as a result, large areas are actually unfit for cultivation and in many instances the situation is becoming more acute and losses steadily worse. The inevitable result is a great problem area in the southern and southeasterly regions. Several projects herein contribute not a little toward a solution and a permanent program of improvement for these and many other areas in the state. New industries and activities must be found to lessen the heavy load of unemployment. These may be of several types, such as part time or garden farming, forestry, woodworking, small unit industries, and many new types of recreational employment.

Recreation, perhaps, when properly planned and supervised, will afford one of the greatest outlets, besides bringing ample financial returns and great human satisfaction.

#### THE PLANNING PROGRAM

The planning program of the Iowa State Planning Board may be arranged as follows:

1. Assemble all existing and pertinent facts in many fields of planning and research.
2. Continue research and study where needed and conduct additional fact finding surveys.
3. Formulate comprehensive and detailed programs and plans for the future.
4. Revise and extend plans as new facts and experience indicate.

#### AN EMPLOYMENT PROGRAM

Besides furnishing considerable productive "white collar" employment to technically trained workers the Planning Board is thoughtfully laying the foundations for both immediate and long time employment. It is hoped to achieve this through a wide variety of planned public works and the rehabilitation of large numbers in carrying out the conservation and development of the land, water, and industrial resources of the state.

# ● P L A N N I N G   A   B E T T E R   I O W A   ●

## A FOUR PART REPORT

This report is more or less arbitrarily divided into four parts, or chapters; Land, Water, People and Commerce. Under each are grouped those projects falling for the most part into each category. (See Frontispiece Chart). Of course, there is much overlapping of many projects into one or more of the other parts.

It should be understood that this first report of progress records only the beginning of our planning program which, it is hoped, provides a solid foundation for the long pull toward the final goal which will be achieved when the lives of the people, the use of the land and water resources, and our commercial and social relations will be on a higher and more permanent plane.

The Iowa State Planning Board envisions a commonwealth where health, happiness, thrift and prosperity prevail, with all the people living in homes that are sanitary, convenient, attractive and durable. It further envisions its cities and its countrysides without ugliness or untidiness, and no unnecessary waste of the land, water or forest resources.

In the fulfillment, even in part, of such a program, there will be annoying delays, disappointments and setbacks, yet the objectives are so sane and indispensable that ultimately they must prevail.

## A SUMMARY OF PROGRESS

In presenting a brief summary of the results, to date, of the many sided activities of the Iowa State Planning Board, it should be borne in

● P L A N N I N G   A   B E T T E R   I O W A   ●

mind that many of the projects are but just started, and many months will be required to appraise results or prepare plans and programs of action.

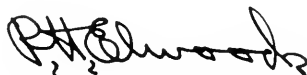
However, this progress report is submitted to the National Resources Board as a record and an indication of more final and specific plans to follow.

Rather than list here many names of contributory collaborators and special workers, such a list is included at the beginning of each project report, the better to affiliate each with the special work done. Mention should be made, however, of the several coordinators who so ably assembled much of the data; and special credit given to Mr. Alvin Coons who edited the reports; to Mr. Paul Heffernan who directed the talented group in the drafting of maps and plans; to Mr. Maxwell Smith who, while in charge of the office staff, assembled much legal data; and to Mr. John R. Fitzsimmons, Landscape Architect for the State Board of Conservation, for much help and many contributions to several projects.

The timely advice and suggestions from Mr. S. Herbert Hare, co-consultant, were especially valuable and are sincerely appreciated. In fact, the entire staff of 150 workers as well as the 175 technical advisors, when called upon, without exception, have responded and labored long and loyally, and it is hoped, effectively toward -

P L A N N I N G   A   B E T T E R   I O W A

September 11, 1934

  
P. H. Elwood,  
DIRECTOR - CONSULTANT





LAND

## LAND UTILIZATION

Projects 1030 - 1031 - 1032 - 1033 - 1034 - 1035

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#### FORESTS AND WASTELAND 1033

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#### SOILS SURVEY 1034

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## LAND UTILIZATION IN IOWA

The rich fertility of the broad expanses of Iowa land in the recent past has been thought to be inexhaustible. Year after year the farmers of Iowa have, in the main, mined their soil in ruthless fashion. Thousands of tons of plant food have been taken from the land with never a thought of replacement. Erosion has been considered annoying, but its real destructiveness was not realized until quite recently. Farmers did not feel the need for conserving and building up the soil, and when faced with the low incomes which have been prevalent in the last decade they endeavored to expand and intensify their corn and small grain production, thus conducting increased erosion.

The significance of this problem in Iowa is at once clear when it is noted that 34,000,000 acres of land or 95.6 per cent of the total area of Iowa is in farms, and much of it under intensive cultivation. Iowa is the greatest food producing state in the union, and it is most essential that the soil which is the foundation of a great industry receive the use and care which its place in the economy of the state justifies and demands.

It was with an appreciation of the need for more complete information relative to the present use of Iowa land and its problems that the Iowa State Planning Board organized technical committees to work on the several phases of land use and closely related problems.

The following committees functioning under the Iowa State Planning Board provided the information which is incorporated in the Land Utilization report.

1. Land Use and Crop and Livestock Planning-Project 1030.
2. Land Purchase and Mortgage-Project 1031.
3. Part Time Farming-Project 1032.
4. Forest and Waste Land-Project 1033.
5. Soils Survey-Project 1034.
6. Fish and Game-Project 1035.

A brief statement of the objectives, information collected, and recommendations of each of these Iowa State Planning Board Committees is submitted here. Part Time Farming-Project 1032 has been treated last because it deals with a specific problem.

LAND USE AND CROP AND LIVESTOCK PLANNING  
Project 1030

The first objective of this committee was to collect, organize and analyze all available information relative to the existing cropping systems and practices in Iowa, in order to get a picture of present uses and abuses of the land resources. The second objective was to utilize this information, making possible the formulation of desirable recommendations for an improved use of Iowa land.

Complete information relative to the present use of Iowa land on a township, county, and regional basis was collected, organized, and prepared for graphic presentation. By using the information from the soil survey and the information obtained relative to existing uses, recommendations have been prepared for changes that must be made in Iowa cropping systems if the valuable soil resources are to be maintained and improved.

The soils experts working on this phase of land utilization for the

Planning Board have developed cropping rotations for each township in Iowa. County and district summaries of these recommendations have also been completed. For a picture of these recommendations, see Figure 1030-21 in this report.

LAND PURCHASE AND MORTGAGE  
Project 1031

The tasks undertaken by this committee were: (a) Development of a sound plan of land ownership by farmers. (b) Collection and organization of information relative to existing tax delinquency and corporate land holdings.

The investigational study of tax delinquency in Iowa which was inaugurated under C.W.A. was completed by the Iowa State Planning Board. The per cent of land on which taxes were delinquent for each year during the period of 1928 to 1932 inclusive was computed.

All available information relative to the Iowa land now held by corporations has been carefully analyzed and a study made of those areas in which corporate holdings are high. Data indicating the amount of tax delinquency, soil characteristics, productivity of the soil, size of farms, and farm income were studied and charted for those townships and counties in which corporate holdings are high.

This study disclosed the fact that in many counties and townships in Iowa 20 per cent and more of the land is now owned by corporations. With this fact in mind and with a belief that the farm land should, from both a private and social standpoint, be in the hands of private owner operators,

preliminary recommendations and plans have been made and submitted here for accomplishing that end.

In view of the great amount of tax delinquency which exists and was disclosed by this survey, it is recommended that further research be conducted which would suggest ways of correcting this distressing condition.

FOREST AND WASTE LAND SURVEY  
Project 1033

The first aim of those who conducted this project for the Planning Board was to obtain complete information relative to existing forest land, waste land and badly eroded land in each land section of Iowa. The second aim was to use this information in selecting the areas in Iowa which it would seem desirable to have in forests. In connection with this it was planned that out of the forestry program recommended would come a program for employment in the forest areas for those who live nearby and who are in need.

The desired information relative to existing and potential forest areas was obtained by a field survey of most of the townships in Iowa. With this information at hand the forest authorities of Iowa State College, conducting this State Planning Board project, made recommendations for forestation in Iowa.

This committee has recommended that certain areas in Iowa be purchased by the government and put into forests. It is the expressed opinion of the authorities who are developing this project that forestation would be the highest and best use in the areas which they are

recommending for such use. Recommendations have also been made to the effect that some of the purchase areas be used as public grazing lands in conjunction with the adjacent forest areas. It is believed that these recommendations, if followed, would check erosion on the lands unfit for agricultural use, provide employment, produce revenue, and enhance the natural beauty of the state.

SOILS SURVEY  
Project 1034

The purposes of the Soils Survey are: (a) To complete the survey of Iowa soils. (b) To develop and test methods by which fertility of land may be maintained permanently. (c) To measure the extent of soil erosion in Iowa and the rate at which it is occurring under varying soil and management conditions.

A map has been prepared for the state which shows the extent and intensity of erosion in every county in Iowa (see Figure 1034-1). A second map showing the extent and intensity of soil acidity in Iowa counties has also been prepared (see Figure 1030-26). The soil surveys are still being conducted and a reconnaissance soil erosion survey is now under way. By employing all available knowledge of Iowa soils and the present use of them, it has been possible to formulate detailed recommendations for improved soil use and cropping systems.

This committee recommends the continuation of the soil erosion survey. Plans for improved cropping systems and rotations have been submitted for each township in Iowa.

The recommendations included in this report cover the most important problems involved in the use of Iowa land. In dealing with each individual problem, an attempt has been made to keep in mind the presence and relations of other problems.

#### A LAND USE PROGRAM

In the preparation of this program for land use in Iowa, the outline prepared by the A.A.A., Land Policies Section, has been followed.

The state has been divided into five districts based upon the major source of income of the farmers within the area, as shown in Figure 1030-5.

- A. Western Meat Area
- B. Southern Pasture Area
- C. Eastern Meat Area
- D. Dairy Area
- E. Cash Grain Area

The problem areas, taken up in each of the five districts, have been divided into seven classes to aid in the specific recommendations for changes in land utilization. These seven classes have been singled out on the basis of the following considerations:

1. Areas in which a substantial part of the farms are on land of such low productivity that arable farming is uneconomic and undesirable, and should be replaced in their entirety by some other major use, such as extensive grazing, forestry, recreation, etc.
2. Areas in which most of the farms should be permanently retired



from cultivation, and devoted to other major use for reasons other than the fact that they are unsuited to farming, for example, where it is desirable to block up public ownership units by the elimination of interspersed private holdings, or where it is desirable to eliminate by other means scattered settlements requiring excessive community expenditure, and areas that have unusually high potential utility for public recreation lands or other public use.

3. Farming areas where, on a significant portion of the farms, a change in the size, tenure, or financial status of holdings, or the provision of sources of supplementary employment to farmers, is desirable to the interests of establishing a sound farm economy.

- a. Farms too small to permit the introduction of pasture or forest or soil protecting crops needed for the improvement or protection of poor or eroding land.
- b. Farms too small for the effective use of farm machinery, rotations, or other conditions of efficient operation.
- c. Large holdings acquired by creditors through foreclosure.
- d. Large holdings in the hands of individuals who are not in a position to bring about suitable conditions of operation, for example, some of the large plantations in the southeastern states operated by tenants or croppers.
- e. Areas where supplementary employment attendant upon the development of a constructive type of management in adjacent timber areas

would facilitate the continuance of agriculture that would otherwise be decadent.

- f. Overcapitalized drainage and irrigation districts that are in serious financial distress.

4. Areas in which the checking of serious erosion on farms should be effected by a change in the cropping system, but without necessitating changes in the size of holdings.

5. Farming areas which can be made suitable for continued occupancy by other farm improvements, e.g., drainage, stream channel straightening.

6. Areas of forest or cut-over land not in farms and not in public ownership where a constructive form of land use should be instituted.

- a. Areas where private enterprise may be expected to effect sustained forest production, or other constructive use.

- b. Areas where public management will be required.

7. Range lands where conditions of land-use result in depletion of forage, in erosion, and in economic instability.

#### CHARACTER OF PROBLEM AND POSSIBLE ADJUSTMENT-TEXTUAL DISCUSSION

##### Class 1.

Under project 1033 of the Iowa State Planning Board, Forests and Waste Land, field workers conducted a survey of the state by sections, collecting information relative to forest areas, gully eroded land, brush land and other waste land.

The forestry people recommended that certain of these sections be retired from cultivation and planted to forests. These recommendations were then interpreted in graphic form on maps. Since the areas recommended for retirement are necessarily the same areas of the state that would fall into class problem area 1, the recommendations of the Forestry project have been used in this report as the basis for determining areas that should be retired from cultivation. In this report, townships of the state in which roughly one-half or more of the area has been recommended for retirement have been placed in problem area 1.

This report is an endeavor to elucidate the real physical condition of the land through use of the materials collected by the soils survey completed through the cooperation of the Iowa State Planning Board, Project 1034, and the social and economic conditions of the inhabitants of these townships, using information tabulated by the Planning Board committee on Land Purchase and Mortgage, Project 1031.

It must be kept in mind that the townships considered under problem area 1 do not include, by far, the entire area of the state that falls into that class problem, since many townships have less than half their areas recommended for retirement and are, therefore, arbitrarily excluded from this classification. There are also townships included with slightly more than one-half recommended for retirement although the rest of the area may be high in productivity. See Figure 1033-1.

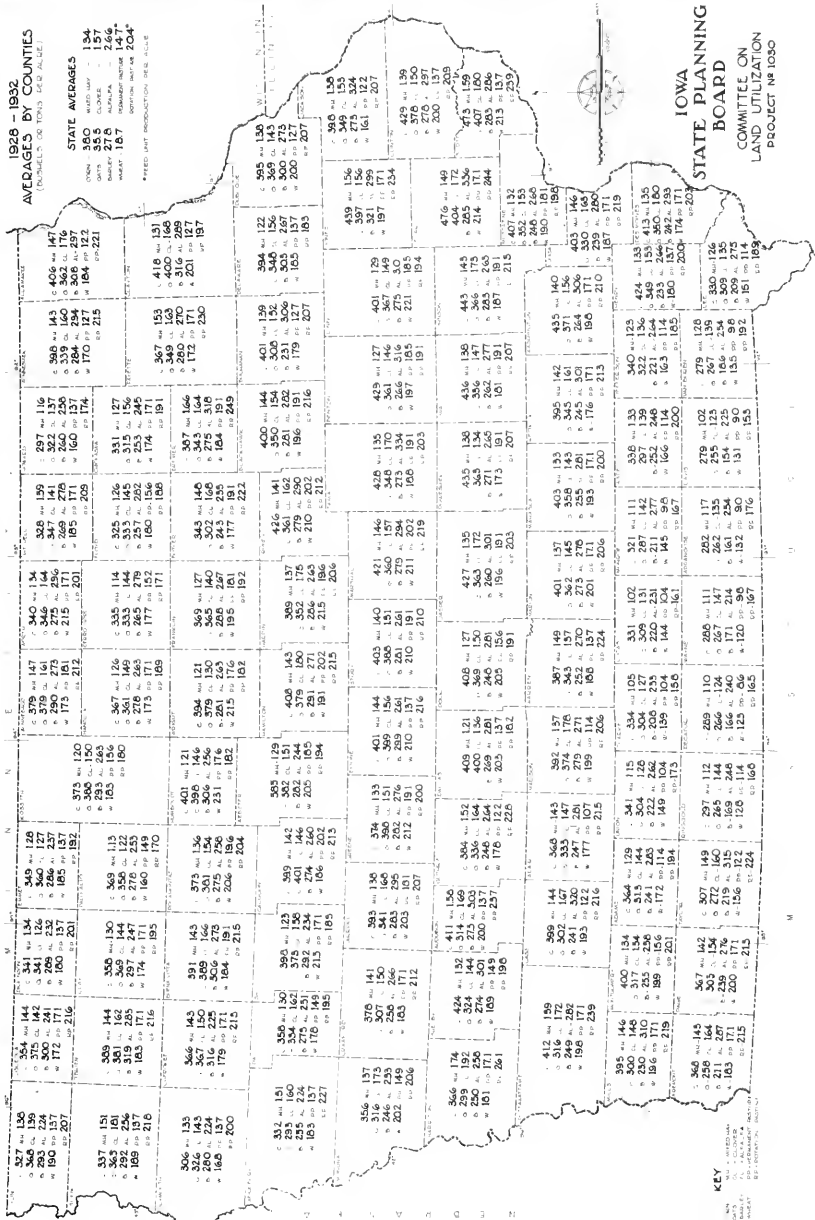
IOWA CROP YIELDS BY COUNTIES

Fig. 1030-1

This map gives the five year average production per acre of corn, oats, barley, wheat, mixed hay, clover, alfalfa, permanent pasture and rotation pasture by county for each respective crop. In general, the production of these crops is higher in the northern two-thirds of the state than the southern one-third. The southern two tiers of counties and four counties along the Missouri River namely, Plymouth, Woodbury, Monona and Harrison have a relatively low yield of all crops as compared to the state average.

# IOWA STATE PLAN

# IOWA CROP YIELDS



IOWA  
STATE BOARD  
COMMITTEE ON  
LAND UTILIZATION  
PROJECT NO 1030

1030-1



#### WESTERN MEAT PRODUCING AREA

Available figures show that the counties in this area have incomes 16 per cent above the average of the state. Due to the high productivity of these counties as a whole, the relatively low productivity of townships of this first class of problem areas within them is concealed. There are, however, 14 townships of the Class 1 problem area distributed among the counties of the Western Meat Producing Area of the state as follows: two in Plymouth, three in Monona, two in Harrison, four in Pottawattamie and three in Mills. Refer to Figure 1030-3 for the more specific location of these townships as well as of those located in the other sections of the state.

Tax delinquency in these townships is higher, in general, than in those adjacent to them. For the 14 townships, the average tax delinquency rose from 15.3 per cent in 1928 to 29.6 per cent in 1930 and to 49 per cent in 1932. See Figures 1031-1, 2, 3, 4 and 5.

Data for shifts in rural population are available only by counties. These figures show an increase in rural population throughout the Western Meat Producing Area. However, this fact is in all likelihood not indicative of the population trend in the poor and badly eroded areas within these counties which have been recommended for forestation.

The soils survey for the counties of this area is complete and thorough. The survey shows that the farms on the uplands that border the bottom and terrace lands have been subject to severe erosion. Improper rotation of crops, lack of organic matter in the soil, increasing soil acidity, the

# CHARACTERISTICS OF FARMING AREAS BY DISTRICTS

Fig. 1030-2

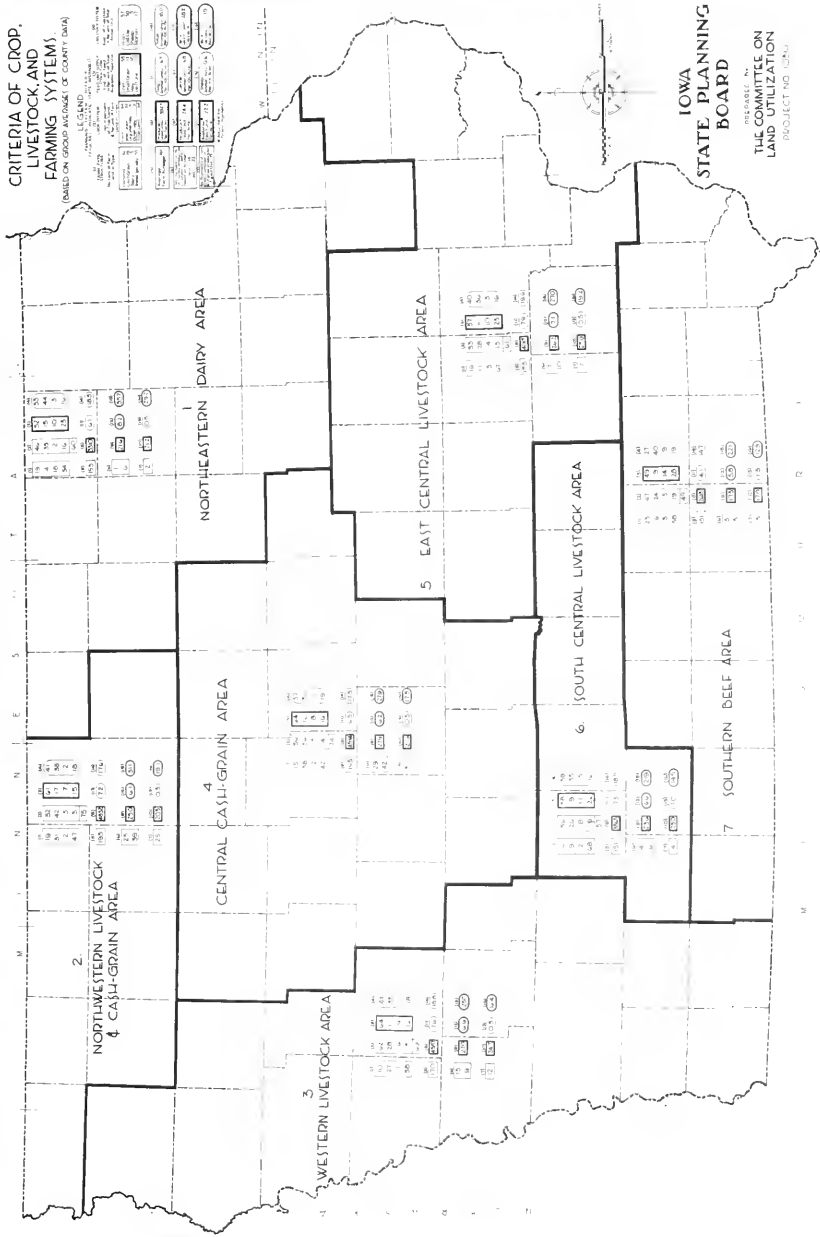
This map is a synoptical, graphic presentation of crop, livestock and farming systems of the state, by districts. There are 16 farm criteria, arranged in the same order and relative position in order to facilitate the comparison of each single criterion for one area with the same for another area. All figures pertaining to land in crops are placed in rectangles and those pertaining to livestock are placed in circles. Within the group of crop-land data, a further distinction has been made by tracing the box lines more heavily around the figures referring to feed structure and supply. Within the group of livestock data, those pertaining to the cattle enterprise have been encircled by heavier lines.



# IOWA STATE PLAN • CHARACTERISTICS OF FARMING AREAS •

CRITERIA OF CROP,  
LIVESTOCK, AND  
FARMING SYSTEMS  
(BASED ON GRAIN AVERAGE OF COUNTY DATA)

AREA	WHEAT	BARLEY	RYE	MAIZE	SOYBEANS	PEAS	CLAY	WHEAT	BARLEY	RYE	MAIZE	SOYBEANS	PEAS	CLAY
1	100	100	100	100	100	100	100	100	100	100	100	100	100	100
2	100	100	100	100	100	100	100	100	100	100	100	100	100	100
3	100	100	100	100	100	100	100	100	100	100	100	100	100	100
4	100	100	100	100	100	100	100	100	100	100	100	100	100	100
5	100	100	100	100	100	100	100	100	100	100	100	100	100	100
6	100	100	100	100	100	100	100	100	100	100	100	100	100	100
7	100	100	100	100	100	100	100	100	100	100	100	100	100	100



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PREPARED BY  
THE COMMITTEE ON  
LAND UTILIZATION  
PROJECT NO. 1024

1030-2



attempt to cultivate steep hillsides, and the non-compliance with erosion preventives are responsible for the decreased productivity of the land.

The percentage of corporate holdings in these townships is in many cases from two to four times greater than in the counties in which these townships are located. In the townships of this area five to 26 per cent of the land is corporately owned. Most of the area under consideration falls in the upper brackets of this range.

Available statistics, both by counties and by townships, do not indicate a serious need for adjustment except for the data on erosion and tax delinquency. The relative high productivity of the farms in the better parts of these townships hide the more unfavorable conditions of the less productive areas. However, these townships have been recommended by the Forests and Waste Land people for forestation due to the unfavorable physical, social, and economic conditions.

#### SOUTHERN PASTURE AREA

The average gross farm income of the counties of the southern pasture area in which Class 1 problem areas are located, is 35.4 per cent below the average gross income of all counties in the state. The 41 townships of class problem area Number 1 are distributed among the counties of the Southern Pasture Area as follows: two in Union, one in Ringgold, two in Clarke, seven in Decatur, three in Lucas, one in Wayne, one in Marion, five in Monroe, four in Appanoose, one in Wapello, six in Davis, four in Van Buren, three in Lee and one in Des Moines.

Appanoose County is conspicuous as an example of the low gross income

# PROBLEM AREA DESIGNATION MAP

Fig. 1030-3

The number in each township designates the class problem in that township. The figure (1) represents areas in which a substantial part of the farms are on land of such low productivity that arable farming is uneconomic and undesirable, and should be replaced in their entirety by some other major use.

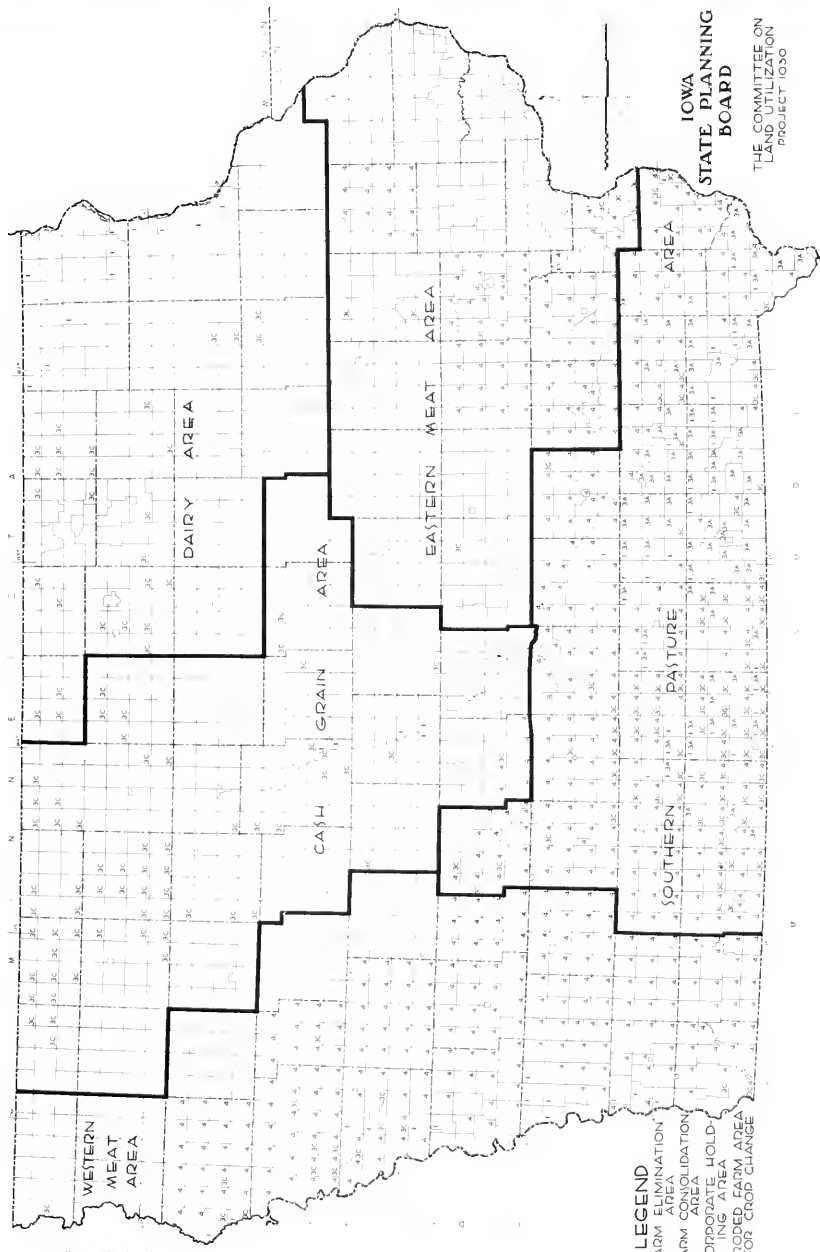
Townships in (3a) are farming areas in which a change in size, tenure, or financial status of holdings is desirable, in the interest of establishing a sound farm economy because of the fact that the farms are too small to permit the introduction of pasture or forest or soil-protecting crops needed for the improvement or protection of eroding land.

Townships marked (3c) are areas in which a change in the financial status of holdings is desirable in establishing a sound farm economy because of the large holdings acquired by creditors through foreclosures.

Number (4) areas are ones in which the checking of serious erosion on farms should be effected by a change in the cropping system, without necessitating changes in size of holdings.

# IOWA STATE PLAN

# PROBLEM AREAS



- LEGEND**
- 1 FARM ELIMINATION AREA
  - 3A FARM CONSOLIDATION AREA
  - 3C CORPORATE HOLDING AREA
  - 4 ERODED FARM AREA FOR CROP CHANGE

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for these counties, with an average gross income 50 per cent below the state average. Likewise, in the counties where the unfavorable conditions are most acute the gross incomes are lowest. The dwelling values range between \$500 and \$1500 on the average farm in the area compared with \$1500 to \$3500 for other farming areas of the state. Refer to Figure 1030-11 for incomes, Figure 1048-20 for value of farm dwellings for a discussion of home conveniences.

Tax delinquency in these townships is among the highest in the state. It increased from an average of 20 per cent delinquent in 1928 to 41 per cent delinquent in 1931. By 1933 corporations had foreclosed and paid accrued taxes thus lowering the extent of delinquency to 33.3 per cent.

The rural population of these counties decreased 25 per cent during the years from 1920 to 1930. The large shifts in some counties are probably due partly to the suspension of mining operations and the evacuation of the miners from acreages adjacent to the mines. See Figure 1030-24.

Erosion is acute in these townships. Gullies occur frequently and attempts have been made to fill them and to reclaim the land which they have injured. At the same time attempts have been made to reclaim land which is too steep, which should have been left in forests and in pastures. Corn has been planted on slopes which are far too steep to be cultivated and consequently there has been a rapid loss of the surface soil. The continuous cropping to corn, the depletion of organic matter in the soil, increased soil acidity, farming of steep hillsides and poor farm practices have all combined to bring about conditions of reduced fertility, shallow surface

AREAS SUITABLE FOR CLOSER SETTLEMENT

Fig. 1030-4

This map designates the 13 counties that are suitable for closer settlement. These counties are located in the north central part of the state. All have farms averaging over 165 acres, and ship out 31 per cent of the corn and 44 per cent of oats. They produce more than 25 feed units per acre and over 4,500 feed units per farm.

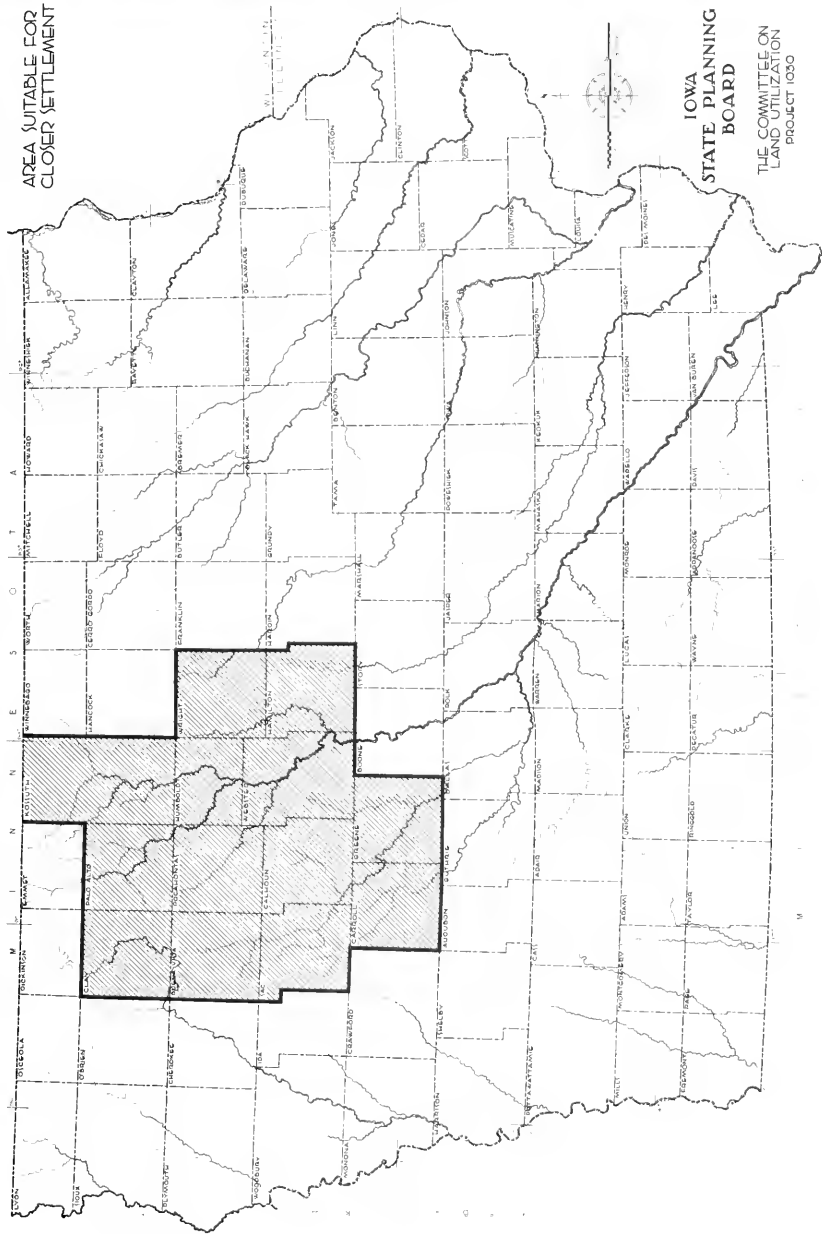


# IOWA STATE PLAN

# CLOSER SETTLEMENT

# AREA

AREA SUITABLE FOR  
CLOSER SETTLEMENT



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soil - or entire removal of loessial covering - and low crop yields, which are prevalent in the townships under consideration. These conditions arise partly through the farmers' inability to buy limestone to neutralize the acid soil and make it fit for legumes. When legumes are difficult to grow, there is a continuous cropping to corn which has further aggravated the depleted soil condition. These conditions are also partly due to the small size of farms which range from 80 to 120 acres and upon which effective rotation is not possible. The result is an intensive corn-hog production. The unfavorable conditions are enhanced by a feeling of hopelessness among the inhabitants of the area. See Figures 1034 - 1 and 2.

The counties in this area in which Class 1 townships are located have a relatively high drainage investment per acre with an average of \$15.75 when the state average is \$12.62 per acre. See Figure 1030-25. The average percentage of families on relief in these counties was 59 per cent higher than for the state during the first seven months of 1934. See Figure 1030-13.

Corporate holdings in these townships are higher than the state average. From 10 to 39 per cent of the area in most of these townships is corporately held. The average for the state is 7.9 per cent. See Figure 1031-7.

The most elucidating figures relative to the need for land use adjustment is offered by the number of feed units produced in the area depleted by erosion.

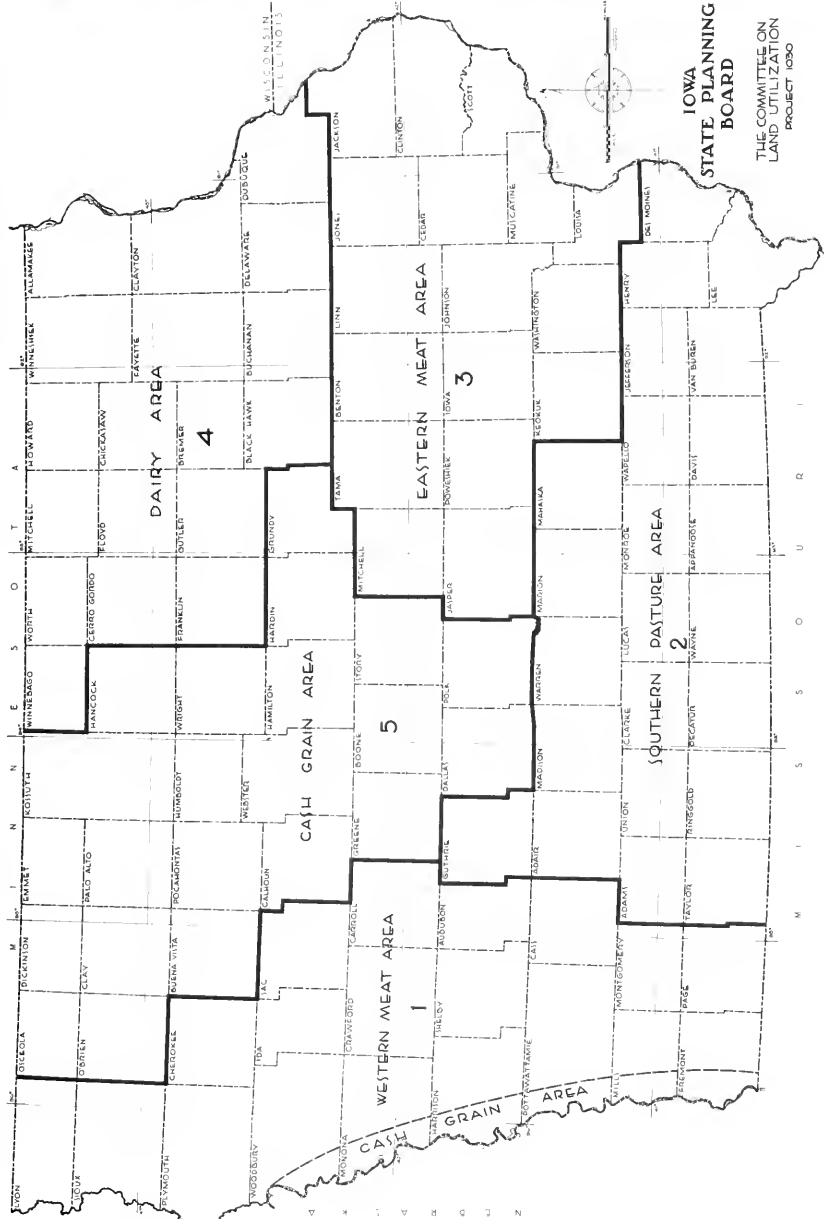
## FIVE TYPES OF FARMING AREAS

Fig. 1030-5

These five types of farming areas are classified as to the predominant type of farming carried on. The areas have been determined primarily by the nature of the crop combinations and secondly by the livestock enterprises through which the crops are utilized. In all these five areas livestock and their products are the chief source of income, although a large amount of the receipts in the Cash Grain Area comes through the sale of grain. In the Dairy Area, receipts from butterfat are of leading importance. In the other three areas, hogs and beef cattle furnish the major part of the income.

# IOWA STATE PLAN

## TYPES OF FARMING AREAS



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Eight of the 13 counties in the area produced less than 17 feed units\* per acre. The other five produced less than 20 feed units per acre. The average for the cash grain area in the north central part of the state was 26 feed units per acre. See Figures 1030-6 and 7. The inability of this farm land to produce sufficient amounts of feed units prevents it from maintaining livestock necessary for efficient farming and proper crop rotations.

#### DAIRY AREA

In this area there are 12 townships of the Class Number 1, distributed in three counties as follows: four in Clayton, five in Allamakee and three in Winneshiek. The average gross income in all the counties of this area is 20 per cent below the average for the state.

In the 12 townships under consideration the average tax delinquency increased from 22 per cent in 1928 to 39 per cent in 1931. In 1932 it increased to 41.4 per cent while the average for the state decreased. However, the percentage of corporate holdings is low; thus the tax delinquency would not decrease in these counties as it did over the state generally due to foreclosure by corporations and their payment of accrued taxes. The average

-----

- \* 1. All produce convertible into corn.
 

Corn - 1 feed unit per bu.	Wheat - 1.07 feed units per bu.
Oats - .43 feed unit per bu.	Soy Beans - 1.34 feed units per bu.
Barley - .73 feed unit per bu.	All Legumes - 18 feed units per ton.
Mixed Hay - 15 units per ton	

# FEED UNIT PRODUCTION PER ACRE BY TOWNSHIPS

Fig. 1030-6

This map shows the average number of feed units\* produced by each acre of crop land in the townships. Feed unit production is conspicuously low in the southern counties, averaging 17.5 per acre, compared to the state average of 24.4 per acre. Some townships in the northeastern counties are also relatively low. The counties in the western, and central parts of the state, are high with an average of above 27 feed units per acre.

\* Feed conversion factors are based upon digestible nutrients.

<u>Product</u>	<u>Feed units</u>
1 bushel of corn	1.00
1 bushel of wheat	1.07
1 bushel of rye	.75
1 bushel of soy beans	1.26
1 ton of legume beans	18.00
1 ton of mixed hay	15.00
1 ton of timothy hay	38.70

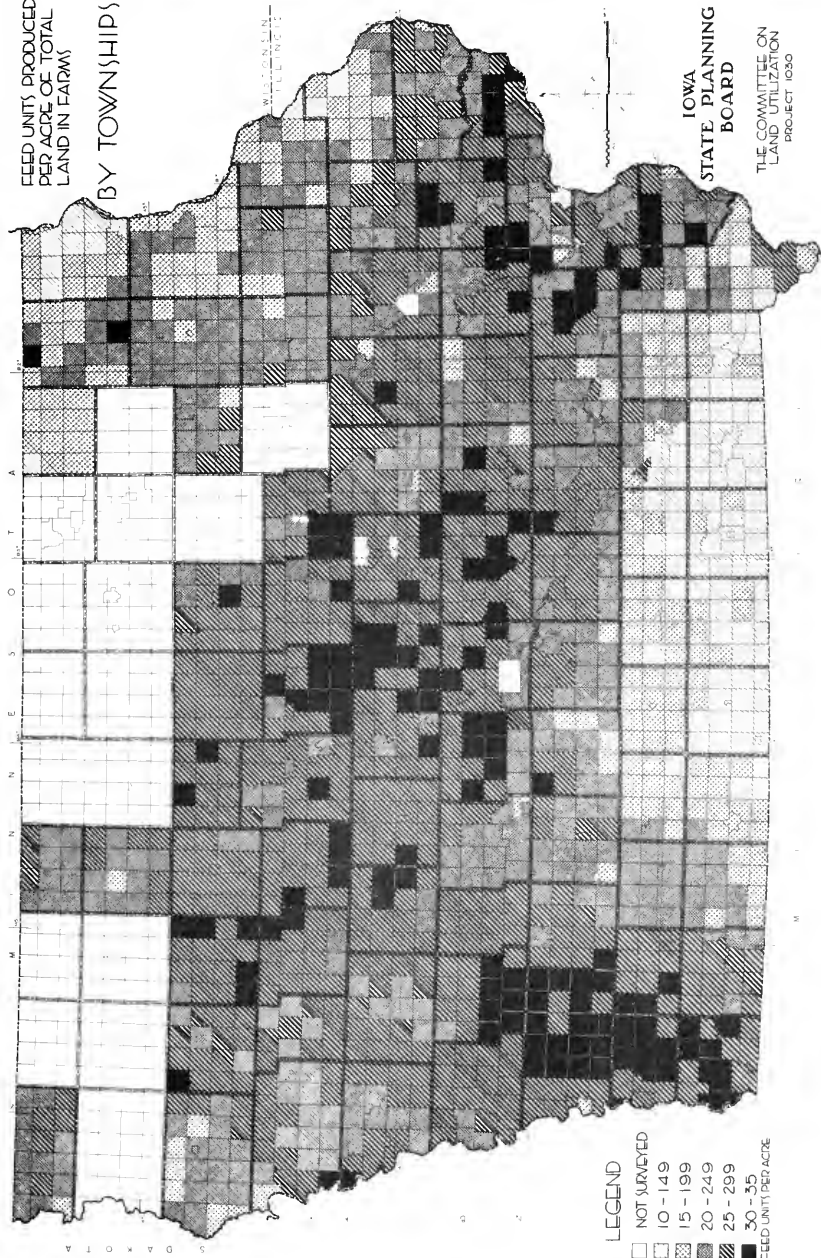


# IOWA STATE PLAN

## FEED UNIT PRODUCTION

FEED UNITS PRODUCED  
PER ACRE OF TOTAL  
LAND IN FARMS

BY TOWNSHIPS



### LEGEND

- NOT SURVEYED
  - 10 - 14.9
  - ▨ 15 - 19.9
  - ▩ 20 - 24.9
  - 25 - 29.9
  - 30 - 35
- FEED UNITS PER ACRE

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corporate ownership in the counties of this area in which townships of Class 1 are located is 3.9 per cent compared with the state average of 7.9 per cent.

The rural population of Allamakee County decreased 20 per cent between 1920 and 1930. Winneshiek County decreased 5.6 per cent and Clayton County only 1.9 per cent.

The land of these townships is rough and hilly. The predominant soil types are Clinton and Tama silt loams. The soil is quite acid requiring from one and one-half to three tons of lime per acre to neutralize. The high acidity tends to make legumes hard to produce thus making proper crop rotation difficult. See Figure 1030-26.

Figures for the capital investment in drainage enterprise are available only for Allamakee County which shows an investment of \$23 per acre compared to the average of the state of \$12.62 per acre. However, for the most part the townships under consideration are not burdened with drainage problems so the \$23 per acre for drainage should not be interpreted as applying primarily to them.

The production of feed units per acre in the townships under consideration is conspicuously low. By townships the average is 16 feed units per acre compared with 26 feed units per acre in the cash grain area. See Figures 1030 - 6, 7 and 8.

#### CASH GRAIN AREA

There are only five townships of Class Number 1 problems in the cash grain district, distributed among the counties as follows: three in Boone

FEED UNITS PRODUCTION PER ACRE BY DISTRICTS

Fig. 1030-7

Feed units per acre are shown for each of the seven districts. The Central Cash Grain Area has the highest per acre feed unit production with an average production between 26.7 and 28.6 units per acre. The Northwestern Livestock and Cash Grain, Western Livestock, and East Central Livestock Areas rank second, ranging between 23.7 and 26.6 feed units per acre. The South Central Livestock Area comes next with an average production of between 21.7 and 23.6. The Northeastern Dairy Area follows with a 19.7 to 21.6 production; and the Southern Beef Area is last with an average production of 17.4 to 19.6 feed units per acre.

# IOWA STATE PLAN

## FEED UNIT PRODUCTION

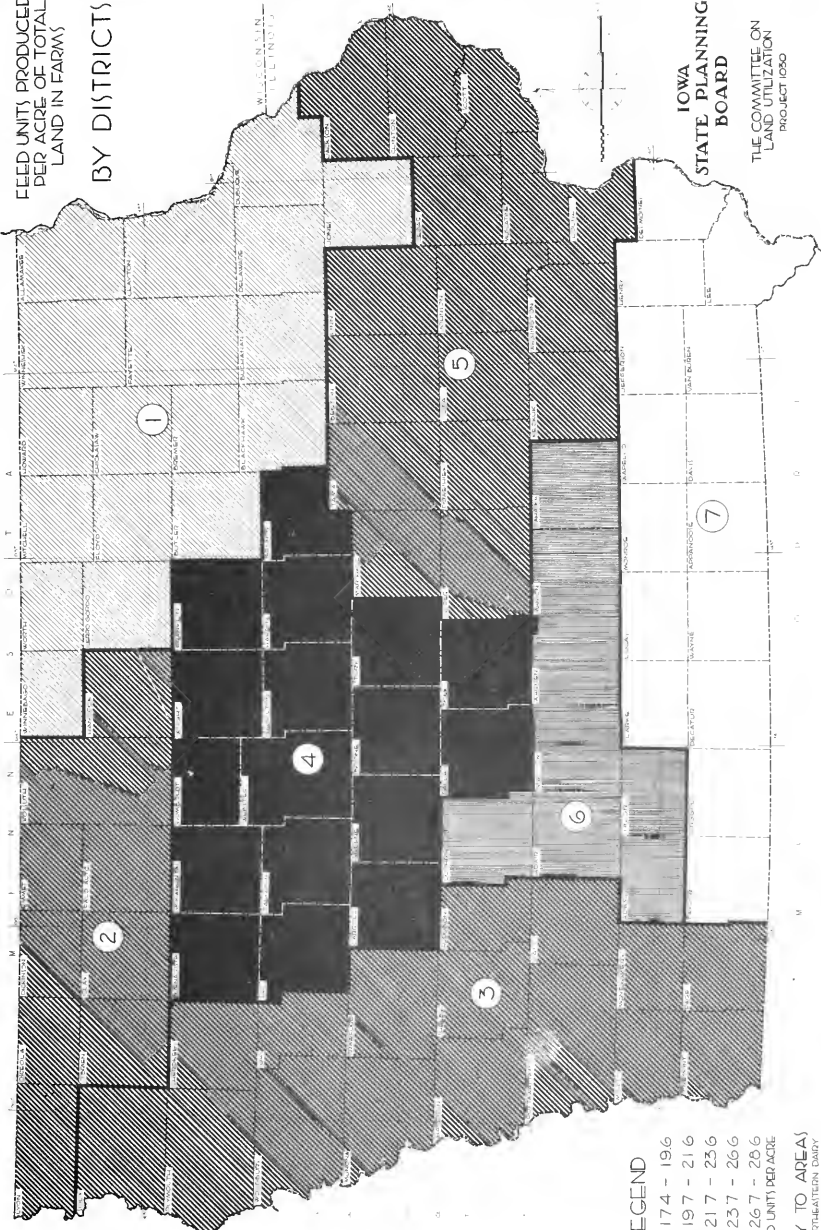
FEED UNITS PRODUCED  
PER ACRE OF TOTAL  
LAND IN FARMS

BY DISTRICTS

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1030-7



### LEGEND

- 17.4 - 19.6
- ▤ 19.7 - 21.6
- ▥ 21.7 - 23.6
- ▦ 23.7 - 26.6
- 26.7 - 28.6

FEED UNITS PER ACRE

### KEY TO AREAS

- ① NORTHEASTERN DAIRY
- ② NORTHEASTERN LIVESTOCK & CASH GRAIN
- ③ CENTRAL DAIRY
- ④ CENTRAL CASH GRAIN
- ⑤ EAST CENTRAL LIVESTOCK
- ⑥ EAST CENTRAL LIVESTOCK
- ⑦ SOUTHERN BEEF



County and two in Webster County. Statistics for the counties in which these townships are located are hardly indicative of the actual conditions existing in the problem townships.

Tax delinquency and corporate ownership are higher than in adjacent townships.

The land is rough and severely eroded and is not adaptable to farming conditions.

#### MEANS OF EFFECTING ADJUSTMENT IN CLASS 1.

It is recommended by the Forestry people that townships and units smaller than townships that fall in Class 1 area be retired from cultivation and planted to pasture and forest land and placed under the control of the state or national government. See Figure 1033-1.

The recommendations for the utilization and readjustment of this land are by no means absolute or final. Details for these recommendations must be worked out and additions and revisions made.

Basing an opinion on the existing physical conditions of the soil, and social and economic conditions of the inhabitants, revealed by surveys made for this problem area, the Forestry Department believes that it would be advisable for a governmental agency to buy the sub-marginal land, plant it to pasture and forest, control grazing and wood supplies, and furnish supplementary employment for low income families. With the good roads that have been built, administration of the non-contiguous areas in forest and pasture land would not be difficult.

FEED UNITS PRODUCTION PER FARM BY TOWNSHIPS

Fig. 1030-8

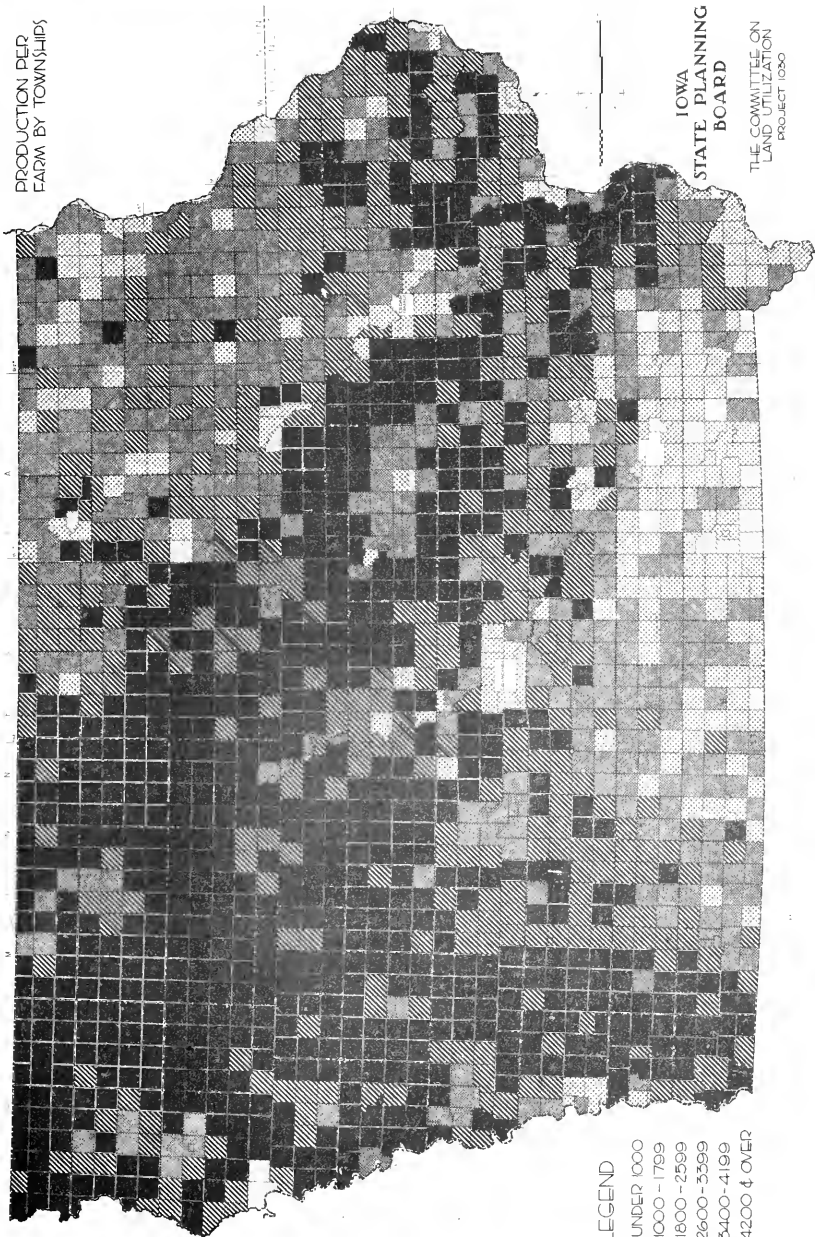
Feed unit production per farm by townships is shown on the opposite page. The majority of townships having less than 1,800 feed units per farm are located in the Southern Pasture Area with a few scattered throughout the Eastern Dairy Area. This figure is considered very low in comparison to the Eastern Meat, Cash Grain, and Western Meat Area, which produce from 3,400 to 8,000 feed units per farm.



# IOWA STATE PLAN

## FEED UNITS PER FARM

PRODUCTION PER  
FARM BY TOWNSHIPS



### LEGEND

- UNDER 1000
- ▤ 1000 - 1799
- ▥ 1800 - 2599
- ▧ 2600 - 3399
- ▨ 3400 - 4199
- 4200 & OVER

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## CLASS 2

Areas which are suited to farming but which should be placed in another use because of their greater utility in such other use, do not exist in significant quantities in Iowa.

Likewise, areas of scattered settlement involving excessive community expenditures are not a major problem in any large sections of the state. Areas which have a high potential utility for public recreation and other public uses, such as will be considered in a later section of this report, are, practically without exception, severely handicapped in one or several phases of agricultural use. There will be little occasion for blocking up existing publicly owned units of land, and it appears that where such action might be required no large amounts of good farm land will be involved.

## CLASS 3

The problem townships in Iowa within which it appears that farm consolidation would be the most desirable means of correcting the existing problem are concentrated in fourteen counties of the southern pasture area. A brief inspection of Figure 1030-3 will make possible a better visualization of the exact location of these townships.

The townships constituting this class problem are, as might be expected, not contiguous. The factors which have led to their existing distribution will be indicated in the course of the textual discussion which follows.

An attempt has been made to employ fully all available data relative to the physical status of the soil and its production history in selecting

AVERAGE SIZE OF FARM BY TOWNSHIPS

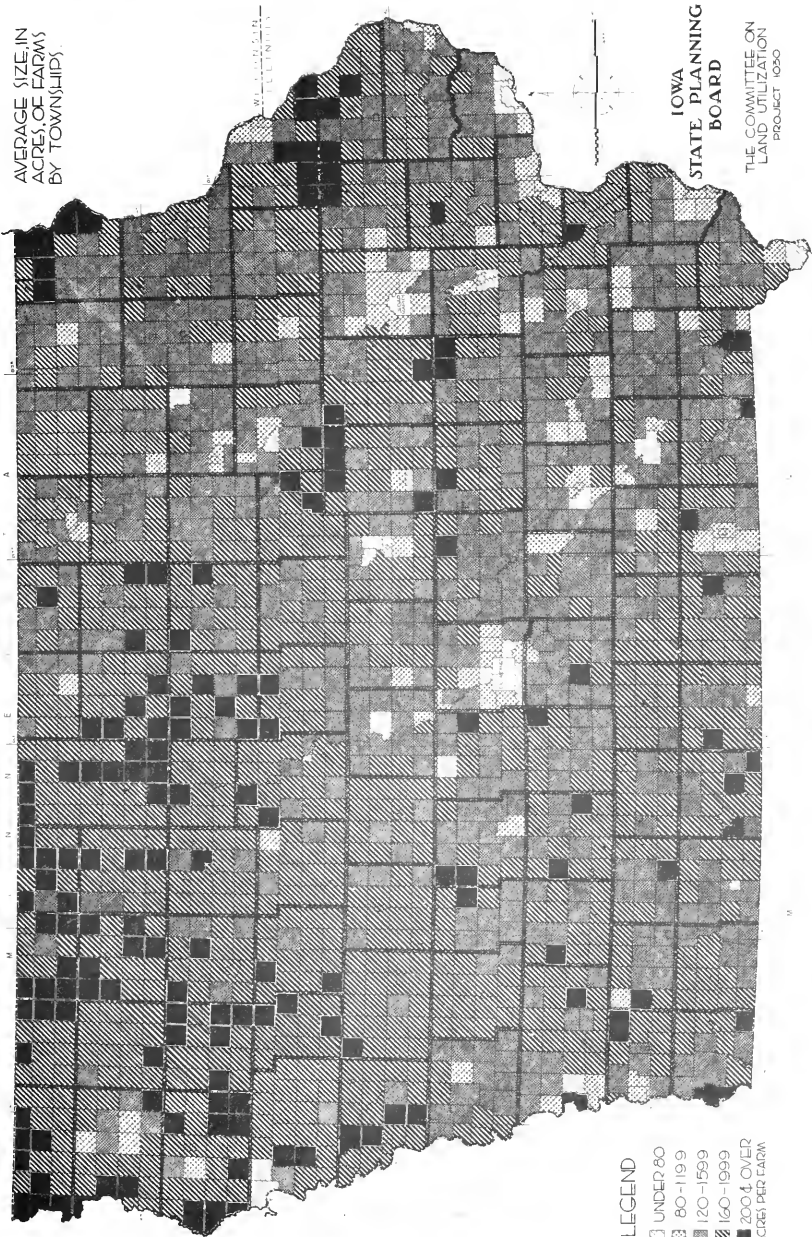
Fig. 1030-9

This map shows the average size farms by townships. The greater number of townships having farms ranging from 160 to 200 acres are located in the Cash Grain Area and in the north half of the Western Meat Producing Area. The southern half of this area is much the same as the Southern Pasture, Eastern Meat and Dairy Areas each having smaller farms than the Cash Grain Area. About 85 per cent of the townships in the Southern Pasture Area have farms ranging from 120 to 159 acres in size.

# IOWA STATE PLAN

## AVERAGE SIZE OF FARM

AVERAGE SIZE IN  
ACRES OF FARMS  
BY TOWNSHIPS



### LEGEND

- UNDER 80
  - ▨ 80-119.9
  - ▧ 120-159.9
  - ▩ 160-199.9
  - 200 & OVER
- ACRES PER FARM

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the townships which fall in this problem class.

Detailed statistics on erosion are not available and could be obtained only after a careful field survey. However, Figure 1034-4 prepared by the Soils Survey gives us a picture of the relative occurrence and severity of erosion in the various sections of the state. As indicated on this map, the most extensive erosion has occurred in the southern pasture area where all of the problem 3a townships are located.

To facilitate comparisons of productivity and total production among counties and townships the corn, small grain, hogs and pasture were converted into feed units.

Placing the total farm production in the common terms of feed units has made possible exact and very useful comparisons among townships, counties and areas within the state and has provided a valuable criterion for the selection of the townships containing the problem 3a.

An analysis of productive capacity per farm and per acre, in this area, very strikingly revealed an acute situation of low productivity. In addition to this, the average farm size in these townships is small compared to the other sections of the state. Upon brief inspection of the townships constituting problem area 3a, or in other words, those townships ranging from 1000 to 2600 feed units produced per farm, it is at once apparent that the average farm in this section produces only half or less than half the feed units that the average farm in the area directly north does. A partial explanation of this situation may be found in Figures 1030-6 and 7 which show the feed unit per acre production in the problem area and

AVERAGE FARM SIZE BY DISTRICTS

Fig. 1030-10

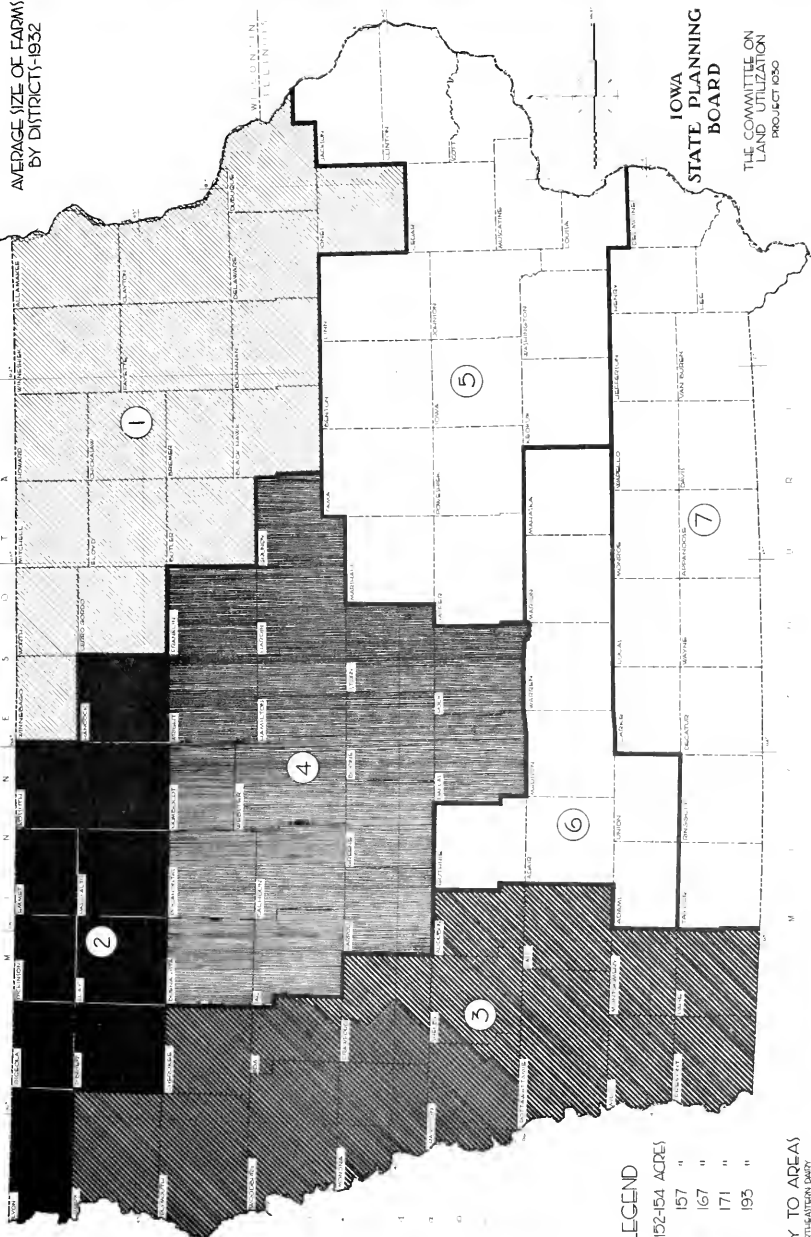
This map shows the average size of farms by districts. It indicates larger farms in the west, west central, and northwest parts of the state averaging over 165 acres per farm compared to the state average of 161 acres per farm.



# IOWA STATE PLAN

# AVERAGE FARM SIZE

AVERAGE SIZE OF FARMS  
BY DISTRICT-1932



## LEGEND

- 192-154 ACRES
- ▤ " 157 "
- ▥ " 167 "
- ▦ " 171 "
- " 193 "

## KEY TO AREAS

- ① NORTHWESTERN DISTRICT
- ② NORTHERN DISTRICT
- ③ NORTHEASTERN DISTRICT
- ④ CENTRAL DISTRICT
- ⑤ SOUTHWESTERN DISTRICT
- ⑥ SOUTHERN DISTRICT
- ⑦ SOUTHEASTERN DISTRICT

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adjoining sections. Here we see that in the townships constituting the problem area the great majority fall in the 10 to 15 feed unit production class. This is in marked contrast to the cash grain area on the north which produces from 25 to 30 feed units per acre.

A brief inspection of accompanying Figure 1030-8 discloses the other factor which contributed significantly to the small feed unit production per farm in this area, namely, the farm size. The average size of farm for all townships in the area is 146.2 acres. This figure compares quite unfavorably with the average of 161 acres for all farms in the state and the 160 to 200 acre farms which appear as averages in the better counties in the cash grain area to the north. Grave consequences are necessarily resulting from this combination of small farms and extremely low feed unit production per acre. Farm operators in this area crop their rough unfertile soil far too intensively in a futile effort to pay heavy debts and in addition obtain something more than a bare subsistence for their families. Very serious soil depletion and widespread and intensive erosion, as indicated in Figures 1034-1 and 2, is the price being paid for the following of such a policy.

The above brief description of a few of the factors involved in this problem indicate to some extent the numerous ramifications involved. It is at once apparent that relatively little is known about many of the factors which constitute the problem.

Further tabulation and analysis must be made relative to the budgeting structure of typical farm units in this problem area.

GROSS FARM INCOME BY COUNTIES

Fig. 1030-11

On this map is shown the relative percentage of the gross farm income that each county received in 1930. Each percentage given shows the deviation above or below the all county average of \$6,073,474.00. The figures indicate that the lowest incomes are in parts of the state where adverse agricultural conditions prevail.





This procedure will offer a picture of the existing production organization and make possible an estimate of what would be involved in a change of the size of the producing unit.

More exact information must be had in reference to the comparative distribution of good, fertile farm land not badly eroded, and of the depleted and eroded farm land. This information would have to be had for townships, and even more preferably, by land sections. The latter would obviously be necessary in establishing a project.

A careful study of cost and price structures as they would impinge upon the new producing units will necessarily have to be made before final recommendations can be formulated on a reasonably safe basis. What would be the most efficient size unit in different sections of this problem area? What type of agriculture will best suit the territory of this problem area? What type of agriculture will best suit the territory from the standpoint of the land involved and the available produce markets? These and other questions of equal import must be answered in the near future.

The social and psychological implications of farm consolidation are many and important. These factors are very briefly suggested here for two reasons; first, to indicate the limitations of the plan which will follow, and, secondly, to indicate the possible lines which further research will take in the coming months.

A considerable amount of research has already been done which will contribute greatly to the formulation of desirable recommendations. A careful compilation and analysis of the production data for the several types of

# GROSS FARM INCOME LESS CERTAIN EXPENDITURES

Fig. 1030-12

The county figures on this chart are made as a per cent of the state average gross income of 1930 less the expenditures for fertilizer, labor, equipment, and electricity. The average county gross income, less expenditures, is \$4,580,048. The northern half of the Western Meat Production Area has 130 to 159.9 per cent of the gross income, of the state average. The southern part of the Western Meat Area and a large part of the Cash Grain Area come next with a range from 100 to 130 per cent. The southern tier from Taylor east, and the second tier from Lucas east have the lowest gross income--only 40 to 70 per cent of the state average.



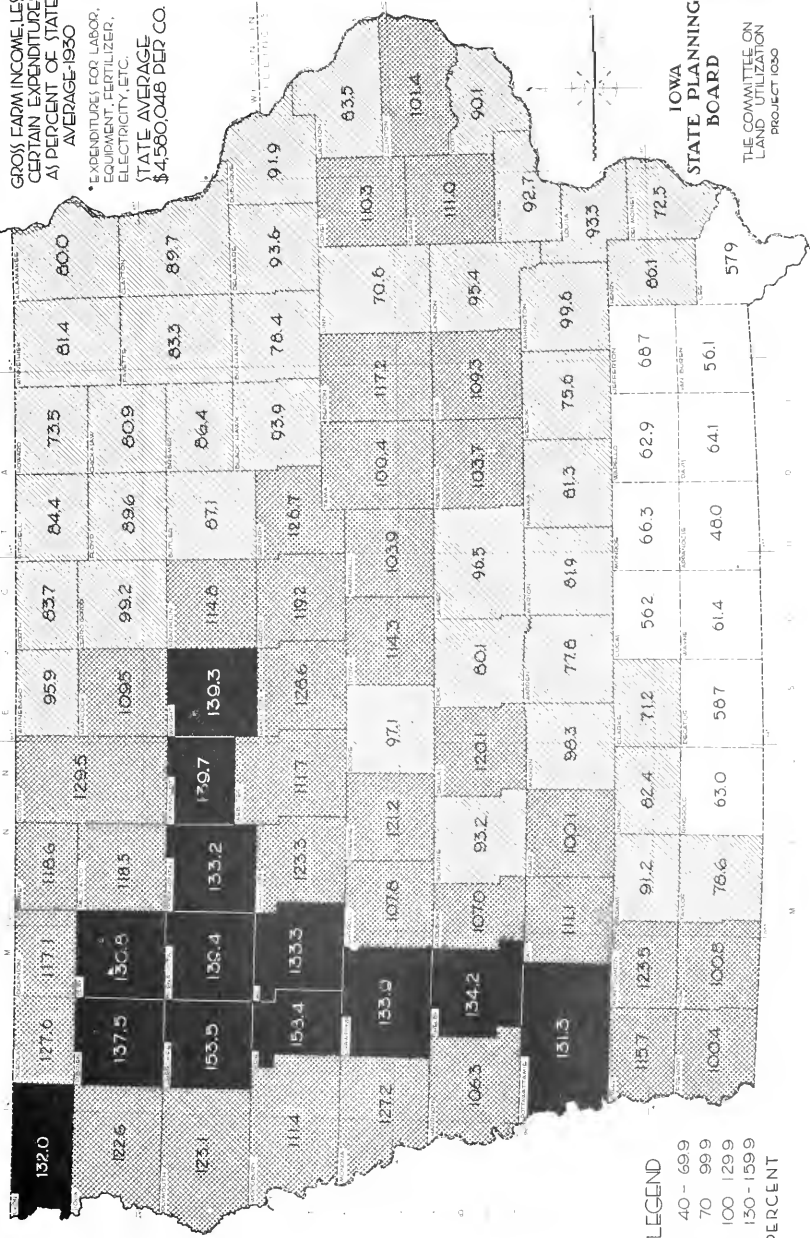
## IOWA STATE PLAN

## NET FARM INCOME

GROSS FARM INCOME, LESS  
CERTAIN EXPENDITURES,  
AS PERCENT OF STATE  
AVERAGE-1930

- EXPENDITURES FOR LABOR, EQUIPMENT, FERTILIZER, ELECTRICITY, ETC.

STATE AVERAGE  
\$4,580.048 PER CO.



## LEGEND

- ☐ 40 - 69.9  
☒ 70 - 99.9  
☐ 100 - 129.9  
☐ 130 - 159.9  
 PERCENT

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farming areas in Iowa has been made. The feed unit structure already referred to is a part of this work. Recommendations for changes in acreages of the main Iowa crops have been made on a township basis with special attention given to the existing soil conditions therein. In addition to this, considerable attention has been given to the Iowa farm budget records which are available for 70 counties. By careful analysis and use of these records it has been possible to estimate the probable effect that the recommended cropping changes would have upon the farm income.

The following data and information further indicate the seriousness of the farm problem in this area and the need for adjustment:

No detailed and specific information is at present available relative to living conditions in this area, but those who have lived there and others who have visited and inspected it are forcibly impressed by the poorly kept appearance of the people and property.

Gross farm income figures for 1930 for the counties in this area, expressed in ratio to the state average, depict in a rather general way the relative position occupied by producers. Seventy-five per cent of the counties in this area had a gross farm income ranging from 45 per cent to 65 per cent of the state average. The other 25 per cent are higher but seldom reach 80 per cent of the state average. See Figure 1030-11. It is rather significant that when certain farm expenditures including fertilizer, labor, equipment and electric power are subtracted from the gross income the counties in this area appear in an even more unfavorable light relative to the state average. See Figure 1030-12.

RELIEF LOAD BY COUNTIES

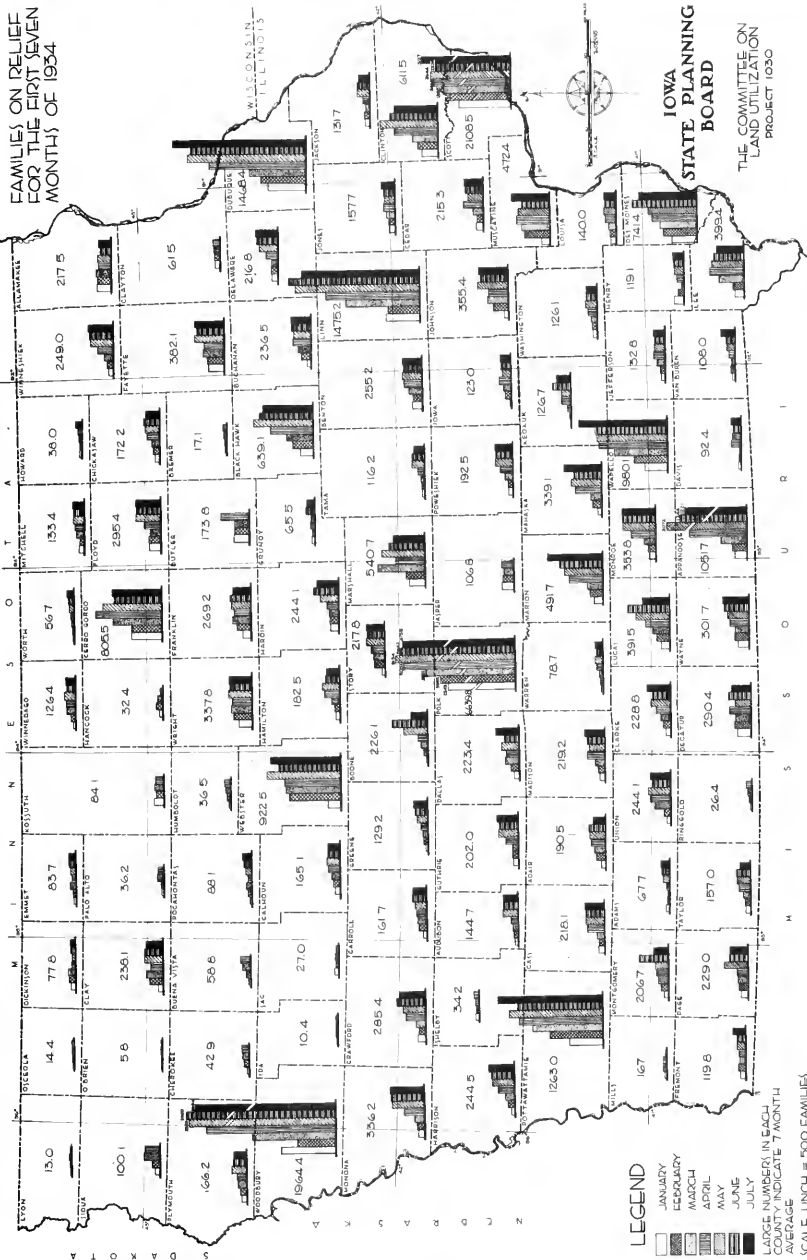
Fig. 1030-13

In this map, each bar represents a month showing the number of families on relief for each of the first seven months of 1934. It will readily be seen that the highest numbers are in the counties with the larger cities. The low case loads are in the north and west parts of the state, and the highest load is in the southern part.

# IOWA STATE PLAN

# FAMILIES ON RELIEF

FAMILIES ON RELIEF  
FOR THE FIRST SEVEN  
MONTHS OF 1934



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Of all sections of the state this one which constitutes problem area 3a gives the most extreme picture of tax delinquency over the five year period, 1928 to 1932.

A brief inspection of Figure 1031-1, which shows 1928 tax delinquency by townships in per cent of total acres, indicates the relatively serious situation in this area which occurred before the general decline of farm prices. The great bulk of the townships in the area range between 16 per cent and 30 per cent delinquent while comparable areas elsewhere in the state show the bulk of the townships as ranging between 0 and 15 per cent delinquent.

Figure 1031-2 shows 1929 tax delinquency; it is readily perceived that the expansion of 16 and 30 per cent groups in this area was notable relative to changes in other sections of the state comparable in size.

Figure 1031-5 depicting 1930 tax delinquency emphasizes the continued relatively serious condition in the southern counties constituting problem area 3a. A great majority of the townships in five of the counties in the area moved into the 61 to 100 per cent delinquent class. However, in this year the other sections of the state moved quite generally into the 16 to 30 per cent delinquent class. A sharp increase in the 46 to 60 per cent and 61 to 100 per cent groups appears on the Figure 1031-4 for 1931. However, the problem area here under consideration no longer provides a sharp contrast to all other sections of the state. Many counties to the north and west now approach the south central counties in the extent and intensity of delinquency. This criteria would not, in 1931, sharply distinguish

# CORN AND OAT SHIPMENTS BY DISTRICTS

Fig. 1030-15

This map gives the net shipment of corn and oats, in percentage of the total county production, in bushels. Corn is the top figure and oats the bottom. The map indicates that every district produced more corn and oats than were consumed. However, some counties within these districts did not produce an amount equal to their consumption as, for example, Allamakee and Wapello counties, which shipped in one per cent each of their corn needs, and Allamakee County which shipped in two per cent of its oats. The Western Livestock Area, the Northwestern Livestock and Cash Grain Area, and the Central Cash Grain Area are the areas which produce the largest amounts of corn for shipment.

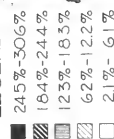


# IOWA STATE PLAN

## SHIPMENT OF CORN & OATS

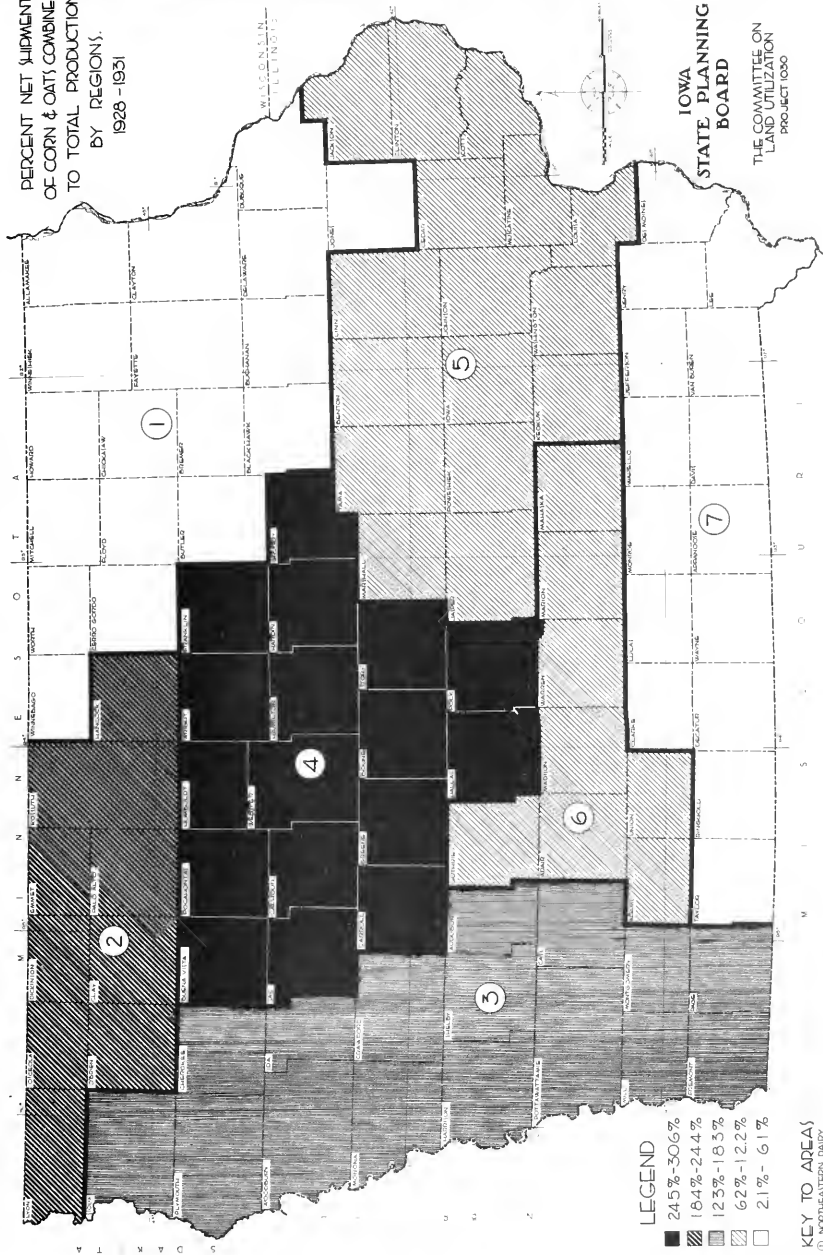
PERCENT NET SHIPMENT  
OF CORN & OATS COMBINED  
TO TOTAL PRODUCTION  
BY REGION,  
1928 - 1931

### LEGEND



### KEY TO AREAS

- ① NORTH-EASTERN DAIRY
- ② NORTH-EASTERN STOCK & CASH GRAIN
- ③ NORTH-CENTRAL STOCK
- ④ CENTRAL CASH GRAIN
- ⑤ SOUTH-CENTRAL STOCK
- ⑥ SOUTH-CENTRAL LIVESTOCK
- ⑦ SOUTHERN BEEF



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1030-15



problem area 3a from other areas of the state. As we turn to Figure 1031-5 for 1932, we find a striking change in the status of delinquency in this southern problem area. The townships in the 46 to 60 per cent and the 61 and over groups have sharply decreased. An analysis of foreclosures and the increase of corporate owned land in these townships are in a large measure an explanation for this sudden decrease in tax delinquencies. Creditors assuming title to the land pay the taxes and the delinquency picture is lightened.

A farm abandonment and emigration survey of this area has not been made but the percentage change in rural population during the period of 1920 to 1930 gives some indication of this shift. Each of the fourteen counties constituting this area showed a decline in population from 1920 to 1930. Five of the counties declined in numbers within the range of 10 per cent to 15 per cent; six counties, 5 to 10 per cent; four counties, 1 to 5 per cent; and one county 42.5 per cent. Comparisons may be made with other areas in the state by referring to Figure 1030-24 on rural population trends in Iowa.

The counties in this area are designated by the soils survey as very extensively eroded - in fact, as the most severely eroded section in the entire state. Both gullying and sheet erosion are very widespread and already have practically ruined thousands of acres of once fertile land. For a picture of this situation see Figures 1034-1 and 2.

The tentative plan to facilitate the consolidation of farms subject to erosion which will be outlined here was prepared by a member of the

YIELD OF CORN BY DISTRICTS - 5 YEAR AVERAGE

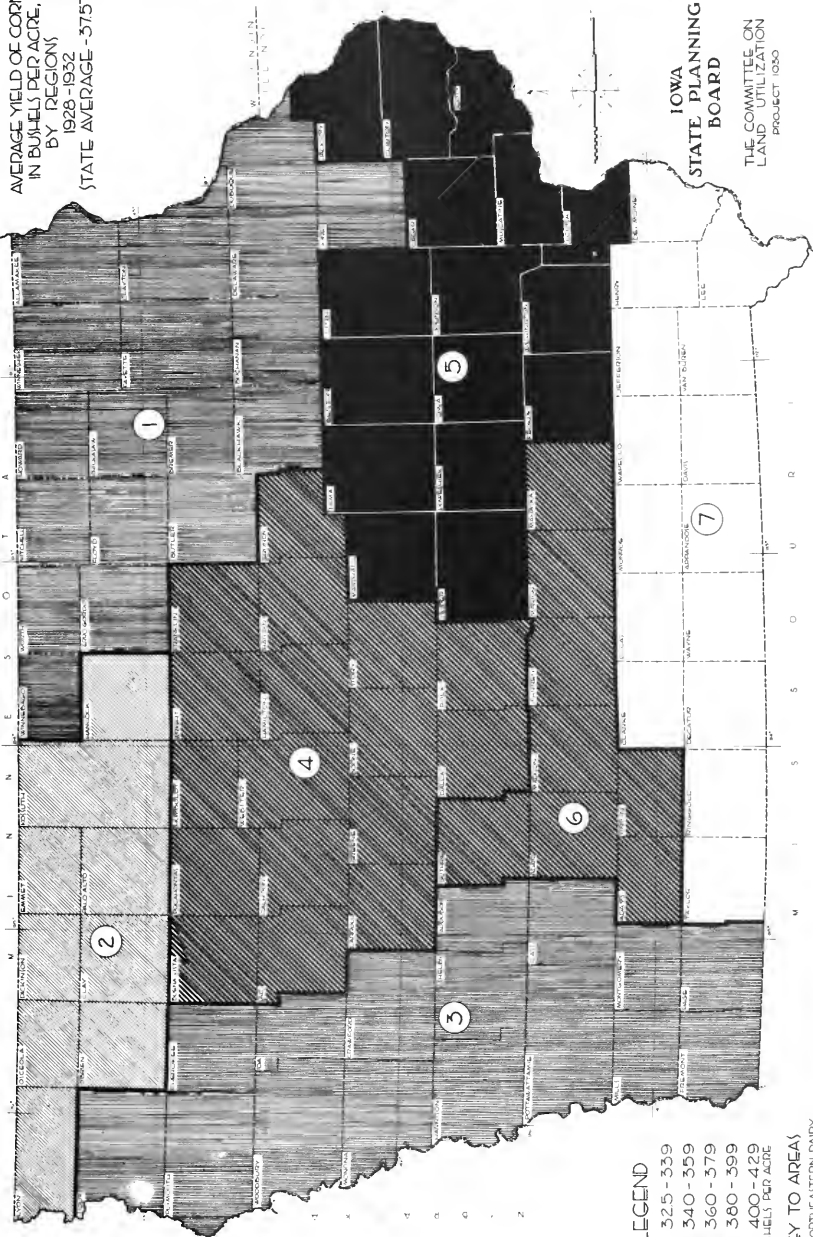
Fig. 1030-17

The East Central Livestock Area has the highest corn yield in the state, averaging 42.7 bushels per acre. The other regions rank as follows: Central Cash Grain, 39.5 bushels per acre; South Central Livestock, 38 bushels; Western Livestock, 37.3 bushels; Northeastern Dairy, 37.1 bushels; Northwestern Livestock and Cash Grain, 35.7 bushels; and Southern Beef, 32.5 bushels per acre.

# IOWA STATE PLAN

## YIELD OF CORN

AVERAGE YIELD OF CORN  
IN BUSHELS PER ACRE,  
BY REGION  
1928-1932  
(STATE AVERAGE - 37.57)



### LEGEND

- 325 - 339
- ▤ 340 - 359
- ▥ 360 - 379
- ▦ 380 - 399
- ▧ 400 - 429
- ▨ 430 - 449
- ▩ 450 - 469
- 470 - 489
- 490 - 509
- ▬ 510 - 529
- ▮ 530 - 549
- ▯ 550 - 569
- ▰ 570 - 589
- ▱ 590 - 609
- ▲ 610 - 629
- △ 630 - 649
- ▴ 650 - 669
- ▵ 670 - 689
- ▶ 690 - 709
- ▷ 710 - 729
- 730 - 749
- 750 - 769
- 770 - 789
- ▻ 790 - 809
- ▼ 810 - 829
- ▽ 830 - 849
- ▾ 850 - 869
- ▿ 870 - 889
- ◀ 890 - 909
- ◁ 910 - 929
- ◂ 930 - 949
- ◃ 950 - 969
- ◄ 970 - 989
- ◅ 990 - 1009

### KEY TO AREAS

- 1. NORTHWESTERN DAIRY
- 2. NORTHWESTERN DAIRY & CATTLE-GRAIN
- 3. NORTHWESTERN DAIRY & CATTLE-GRAIN
- 4. CENTRAL CATTLE-GRAIN
- 5. CENTRAL CATTLE-GRAIN
- 6. SOUTHEASTERN DAIRY
- 7. SOUTHERN DAIRY

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1030-17



agricultural economics staff of Iowa State College. It is submitted with the idea that changes may be made as newer facts are brought to light.

OUTLINE OF A PLAN TO FACILITATE THE CONSOLIDATION  
OF FARMS SUBJECT TO EROSION

It should be noted that the average farm size in these southern counties does not indicate adequately the urgency for a consolidation of farms. Only in connection with figures showing the per cent of farm land in crops, crop yields and productivity of pasture does the relative smallness of those farms become apparent. The land in those southern counties yields about 14 to 17 feed units per acre, as compared to about 25 to 28 feed units in most of the other counties in Iowa.

The pressure involved in getting a living from holdings of 120 to 160 acres of an extremely low productivity has resulted in too intensive a type of cultivation for the types of soil and topography found and has clearly promoted erosion. A considerable area, perhaps 20 to 25 per cent of this land, needs to be retired, either to woodland or permanent pasture, preferably the latter. Such a retirement of crop land, however, would make it impossible for the present number of families to subsist in this area. If the adjustment is made temporarily, by means of current benefit payments, the result will be simply to pauperize the farmers of the area. They would be able to afford a fair standard of living only as long as they received benefit payments. As soon as these stop, their unfavorable competitive condition will again assert itself.

# LAND VALUES BY DISTRICTS

Fig. 1030-10

Areas with high land values are found in the areas having high yielding soil types. The rough, hilly and badly eroded areas have low land values. There are three districts above the state average of \$124.20 per acre, namely, Central Cash Grain with \$141 to \$154, the Western Livestock and the East Central Livestock areas with \$126 to \$140 per acre. The Northwestern Livestock and Cash Grain Area falls just below the state average with values per acre ranging from \$110 to \$125. Next in line come the Northeastern Dairy and South Central Livestock areas between \$96 and \$109. The Southern Beef Area is lowest with only an \$82 to \$95 land value per acre.



# IOWA STATE PLAN

# LAND VALUES

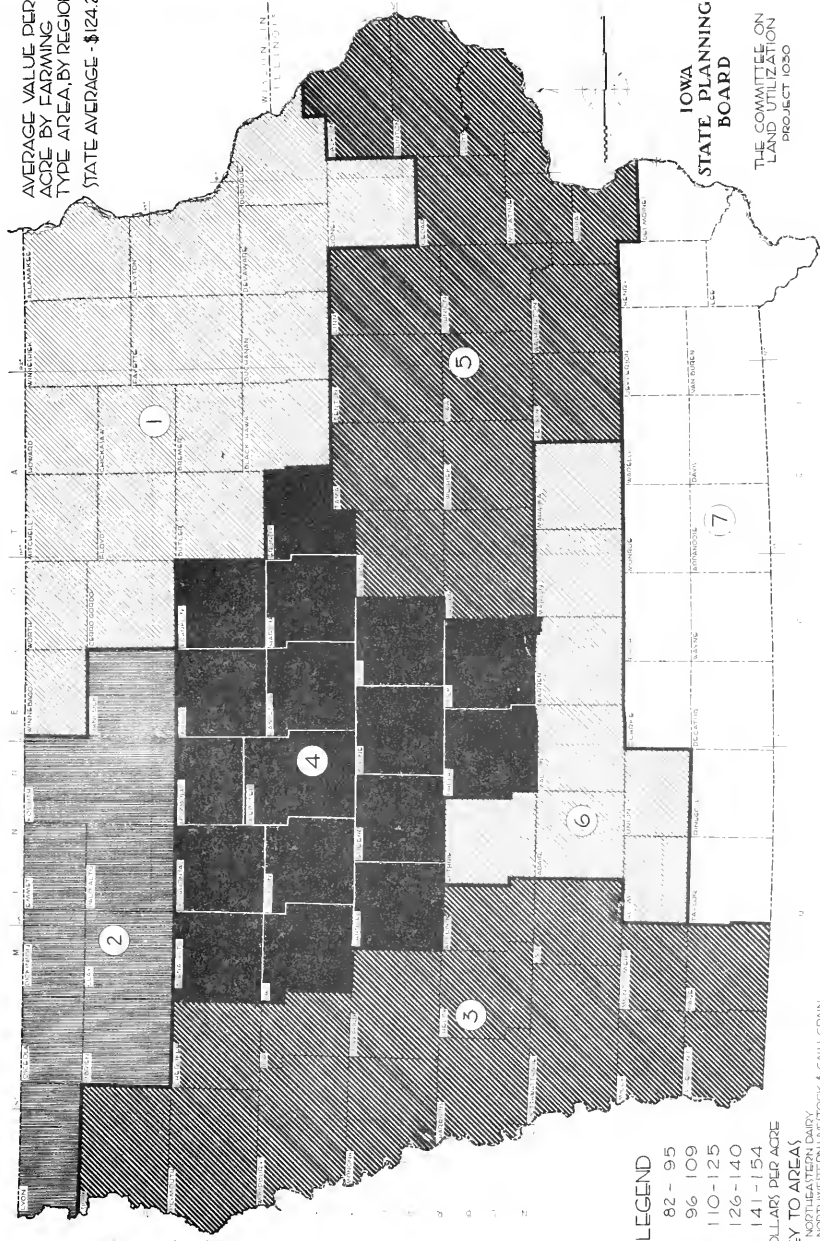
AVERAGE VALUE PER  
ACRE BY FARMING  
TYPE AREA, BY REGION  
STATE AVERAGE - \$124.20

## LEGEND

- 82 - 95
- ▨ 96 - 109
- ▩ 110 - 125
- ▧ 126 - 140
- 141 - 154

## KEY TO AREAS

- ① NORTHWESTERN LIVESTOCK
- ② NORTHWESTERN LIVESTOCK & CATTLE-GRAIN
- ③ WESTERN LIVESTOCK
- ④ CENTRAL LIVESTOCK
- ⑤ EAST CENTRAL LIVESTOCK
- ⑥ SOUTH CENTRAL LIVESTOCK
- ⑦ SOUTHERN BEEF



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1030-20



If we are to build up an agriculture capable of supporting standards of living comparable to those in other parts of the state and without continuous payment of subsidies, it will clearly be necessary to reduce the number of farms in this area. It seems doubtful that benefit payments could be used under the present A.A.A. act to facilitate the consolidation of small holdings into farms large enough to furnish a satisfactory living for the typical farm family. It seems likely that new legislation would be required to accomplish this end.

As a rough and tentative plan it is suggested that, in cases where additional land is acquired by a farmer to bring his holding up to a family-size farm of more extensive type, a remission of perhaps half of the interest be made as benefit payments. This should apply only in cases of new loans from the Federal Farm Loan System, or perhaps from other sources obtained for this specific purpose.

The amount of interest remitted should be limited to some reasonable figure to conserve the appropriation as far as is consistent with results obtained. A limit of \$200 per farm for each of the first five years should be sufficient.

The amount of interest remitted on, for instance, Federal Farm Loans, should be reduced after a period of four or five years until the farmer is carrying the entire load himself, at the end of perhaps eight or ten years. This should provide a means of terminating the assistance and also should discourage too great a rise in land prices.

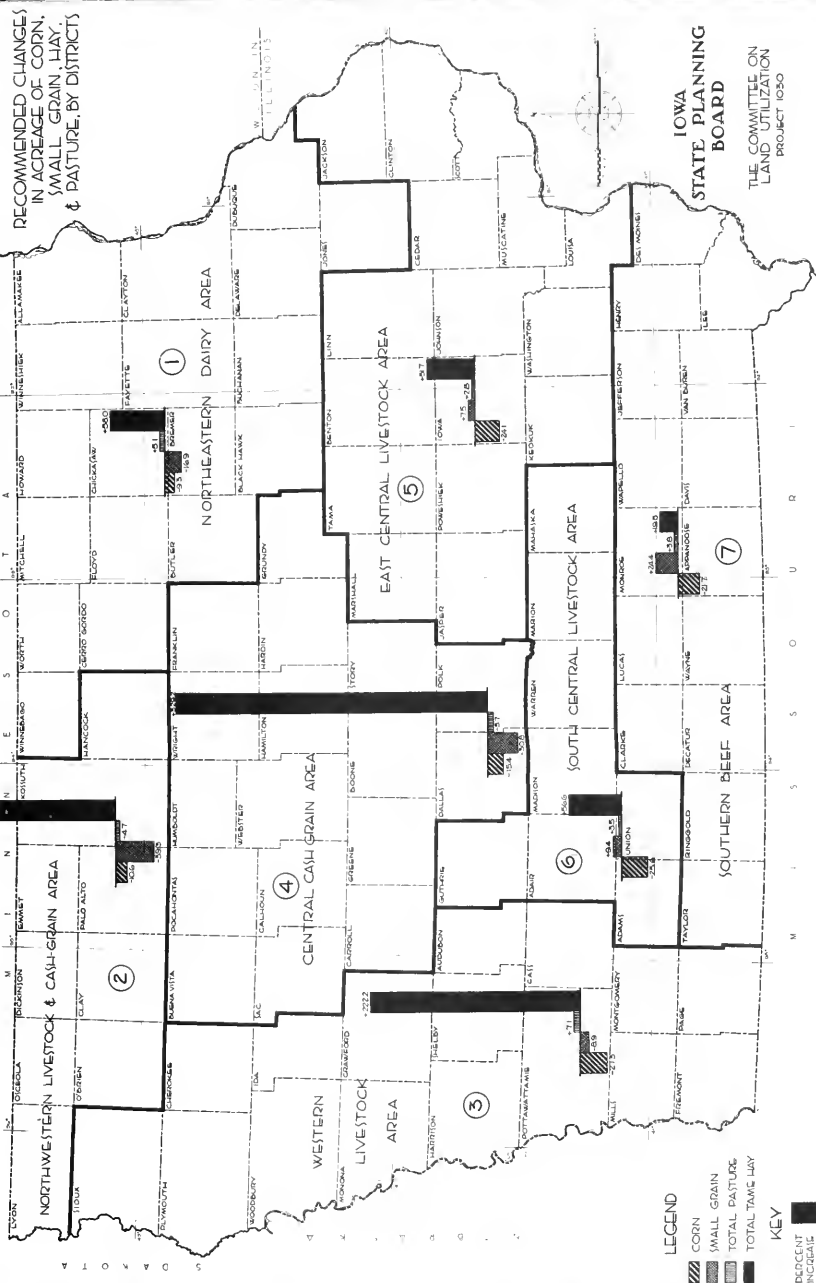
The following schedule is suggested for erosion control benefits:

# RECOMMENDED CROP CHANGES

Fig. 1030-21

It is recommended that Iowa corn acreages be reduced from their 1929 acreages, ranging from a 9.3 per cent reduction in District 1 to 27.3 per cent in District 3. Small grain acreages in Districts 1 to 4 should be reduced from 8.9 per cent in District 3 to 30.8 per cent in District 4. On the other hand, it is recommended that there be an increase of small grains in Districts 5, 6, and 7. The reduced acreages of corn and small grain are to be replaced by pasture and hay crops.

## RECOMMENDED CROP CHANGES



## LEGEND

- |      | CORN | SMALL GRAIN | TOTAL PASTURE | TOTAL TAME LAND |
|------|------|-------------|---------------|-----------------|
| 1982 | 10.0 | 10.0        | 10.0          | 10.0            |
| 1983 | 10.0 | 10.0        | 10.0          | 10.0            |
| 1984 | 10.0 | 10.0        | 10.0          | 10.0            |
| 1985 | 10.0 | 10.0        | 10.0          | 10.0            |
| 1986 | 10.0 | 10.0        | 10.0          | 10.0            |
| 1987 | 10.0 | 10.0        | 10.0          | 10.0            |
| 1988 | 10.0 | 10.0        | 10.0          | 10.0            |
| 1989 | 10.0 | 10.0        | 10.0          | 10.0            |
| 1990 | 10.0 | 10.0        | 10.0          | 10.0            |
| 1991 | 10.0 | 10.0        | 10.0          | 10.0            |
| 1992 | 10.0 | 10.0        | 10.0          | 10.0            |
| 1993 | 10.0 | 10.0        | 10.0          | 10.0            |
| 1994 | 10.0 | 10.0        | 10.0          | 10.0            |
| 1995 | 10.0 | 10.0        | 10.0          | 10.0            |
| 1996 | 10.0 | 10.0        | 10.0          | 10.0            |
| 1997 | 10.0 | 10.0        | 10.0          | 10.0            |
| 1998 | 10.0 | 10.0        | 10.0          | 10.0            |
| 1999 | 10.0 | 10.0        | 10.0          | 10.0            |
| 2000 | 10.0 | 10.0        | 10.0          | 10.0            |
| 2001 | 10.0 | 10.0        | 10.0          | 10.0            |
| 2002 | 10.0 | 10.0        | 10.0          | 10.0            |
| 2003 | 10.0 | 10.0        | 10.0          | 10.0            |
| 2004 | 10.0 | 10.0        | 10.0          | 10.0            |
| 2005 | 10.0 | 10.0        | 10.0          | 10.0            |
| 2006 | 10.0 | 10.0        | 10.0          | 10.0            |
| 2007 | 10.0 | 10.0        | 10.0          | 10.0            |
| 2008 | 10.0 | 10.0        | 10.0          | 10.0            |
| 2009 | 10.0 | 10.0        | 10.0          | 10.0            |
| 2010 | 10.0 | 10.0        | 10.0          | 10.0            |
| 2011 | 10.0 | 10.0        | 10.0          | 10.0            |
| 2012 | 10.0 | 10.0        | 10.0          | 10.0            |
| 2013 | 10.0 | 10.0        | 10.0          | 10.0            |
| 2014 | 10.0 | 10.0        | 10.0          | 10.0            |
| 2015 | 10.0 | 10.0        | 10.0          | 10.0            |
| 2016 | 10.0 | 10.0        | 10.0          | 10.0            |
| 2017 | 10.0 | 10.0        | 10.0          | 10.0            |
| 2018 | 10.0 | 10.0        | 10.0          | 10.0            |
| 2019 | 10.0 | 10.0        | 10.0          | 10.0            |
| 2020 | 10.0 | 10.0        | 10.0          | 10.0            |

KEY

PERCENT  
INCREASE

PERCENT  
DECREASE

1030-21



- a. First to fifth year inclusive, 50% of interest on loan for new purchase.
- b. Sixth year--40% of interest.
- c. Seventh year--30% of interest.
- d. Eighth year--20% of interest.
- e. Ninth year--10% of interest.
- f. None thereafter.

In return for the erosion control benefit payments the farmer is to agree to follow such methods of erosion control as prescribed by the A.A.A. and to refrain from planting intertilled crops on slopes declared subject to serious erosion by A.A.A. inspectors. It should be stipulated that crop acreages conform to whatever general plan of crop control be adopted by A.A.A. Otherwise the farmer should be permitted to carry out his own ideas of crop and livestock organization. Erosion control benefit payments are to cease when any farmer violates these provisions.

It might be desirable to impose an absolute limitation on size of the combined holdings from 240 to 640 acres depending upon situation in the various parts of the area. An examination of farm records and a few case studies should throw some light on desirable size limits.

The newly purchased land should be near enough to the old farm, with which it is to be consolidated, so that the combined areas could be operated effectively as a single unit. A maximum distance of one mile from the farmstead on the old farm to the nearest part of the new land is suggested.

EFFECTIVE ACREAGES

Fig. 1030-22

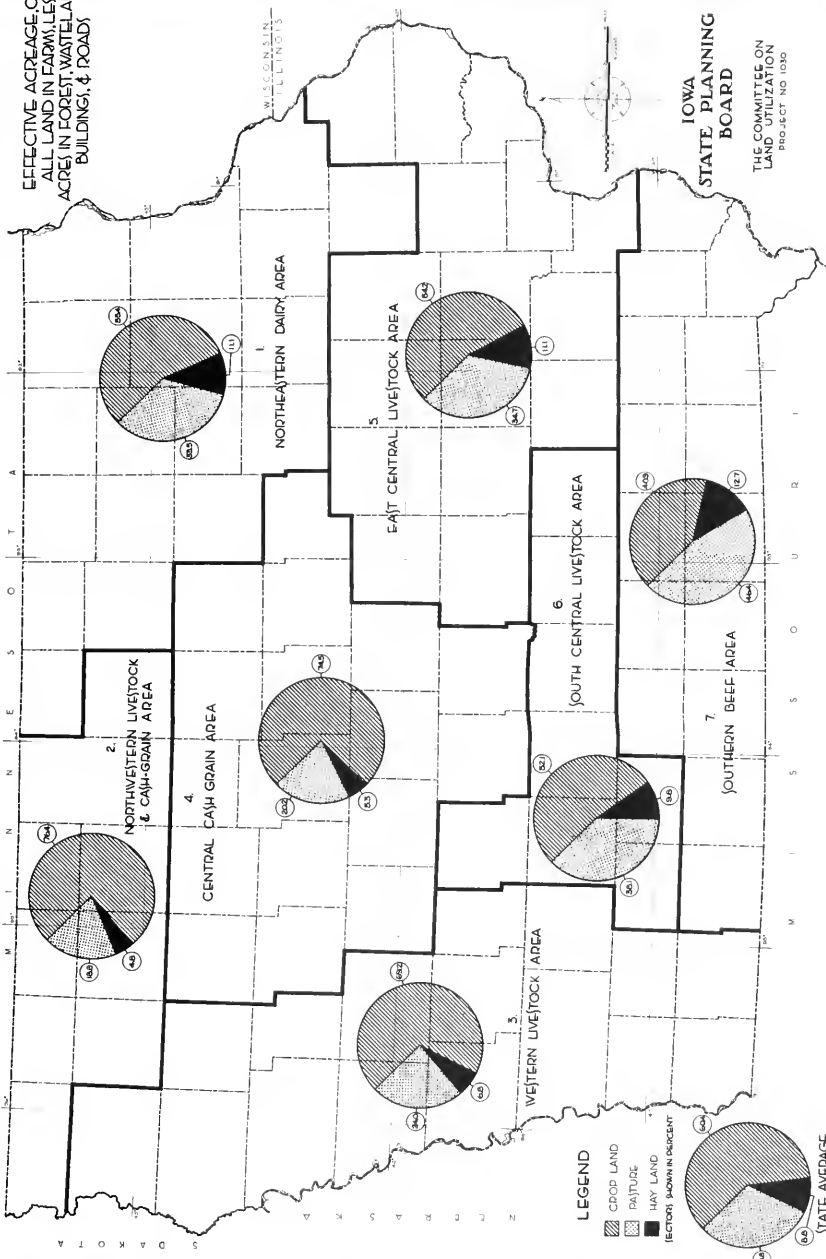
This map gives the effective acreages of crop land by counties in the state. The largest percentages of crop lands are found in the central, west and north west parts of the state.



# IOWA STATE PLAN

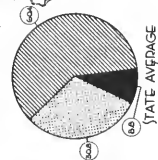
## USE OF FARM LAND

EFFECTIVE ACREAGE OF  
ALL LAND IN FARMS, LESS  
ACRES IN FOREST, WASTE LAND  
BUILDINGS, & ROADY



### LEGEND

- CROP LAND
- PASTURE
- HAY LAND
- FOREST, WASTE LAND, BUILDINGS, & ROADY



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Nothing approaching a "drive" or a campaign should be attempted, since this might be resented by some of the people in the area affected. Opportunity to subscribe to the program should be open to farmers for at least five, and better for ten years. The object is simply to facilitate a natural and spontaneous movement. Emphasis should be put on the saving or resuscitation of land rather than on the reduction in number of farms. But, after all, the nation has a right to concern itself about the conservation of its natural resources, which in this case are seriously threatened.

It might be that some other scheme would be simpler or more effective in bringing about a consolidation of these farms. Whichever way we turn, however, we come up against this problem, and the same is probably true of other areas where there are erosion and poor soil. In this particular area the farmers who are located on moderately large holdings seem to get along about as well as farmers in other parts of the state, but the men on small farms are in a very unfortunate position.

Farms too small for the effective use of machinery, etc., may be found around mining districts and on the edges of towns. They are quite scattered over the state and are of relatively little importance. Most of them are truck farms, small pasture acreages for a cow or a few pigs, etc.

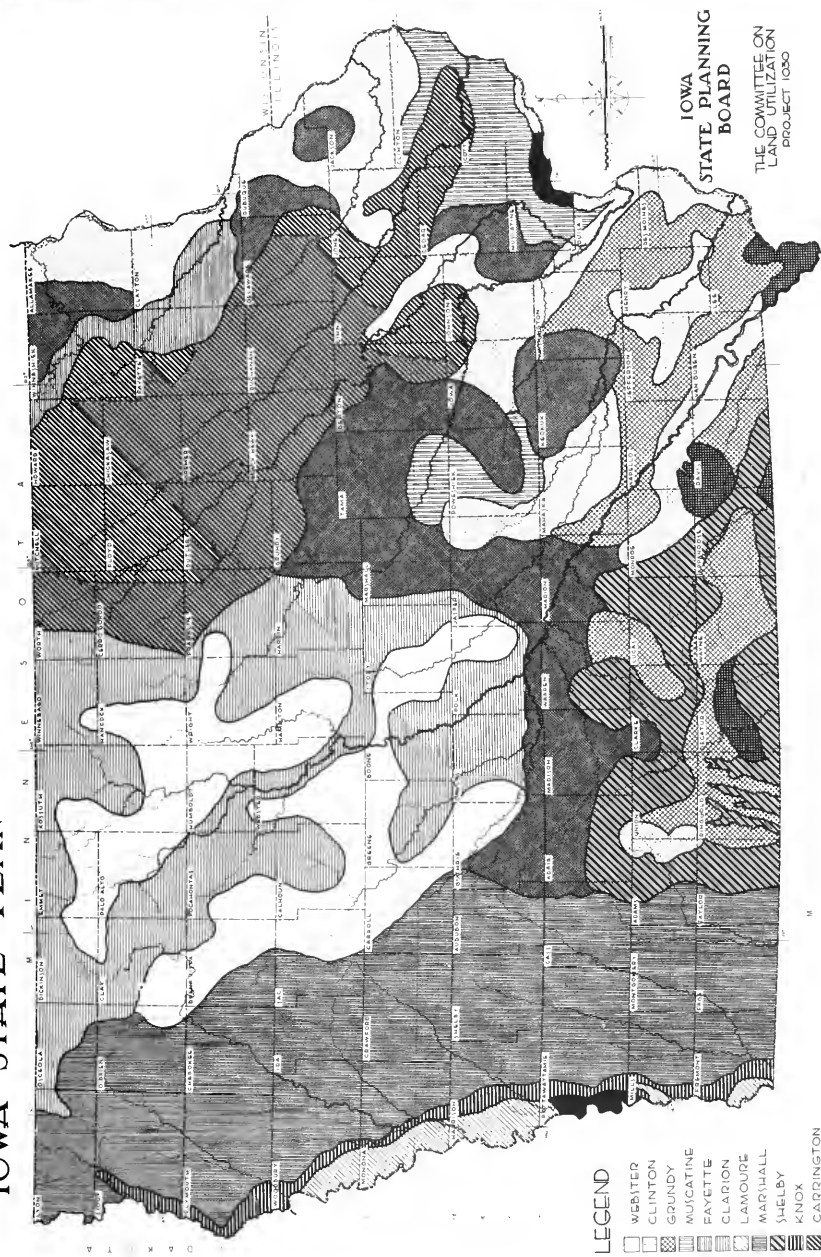
SOIL TYPES MAP BY COUNTIES

Fig. 1030-23

The predominating soil types in Iowa are shown. The types that cover approximately 70 per cent of the state are: Currington, Webster, Clarion, Marshall, Shelby, Grindy, Tama, Muscatine and Clinton. The first four types extend over the northern and western part of the state and each individual type is outlined rather definitely as pertaining to a certain section. The last five types are found in the southern and south eastern parts of the state. This section is rough and contains a greater number of unproductive soil types than does any other part of the state.

# IOWA STATE PLAN

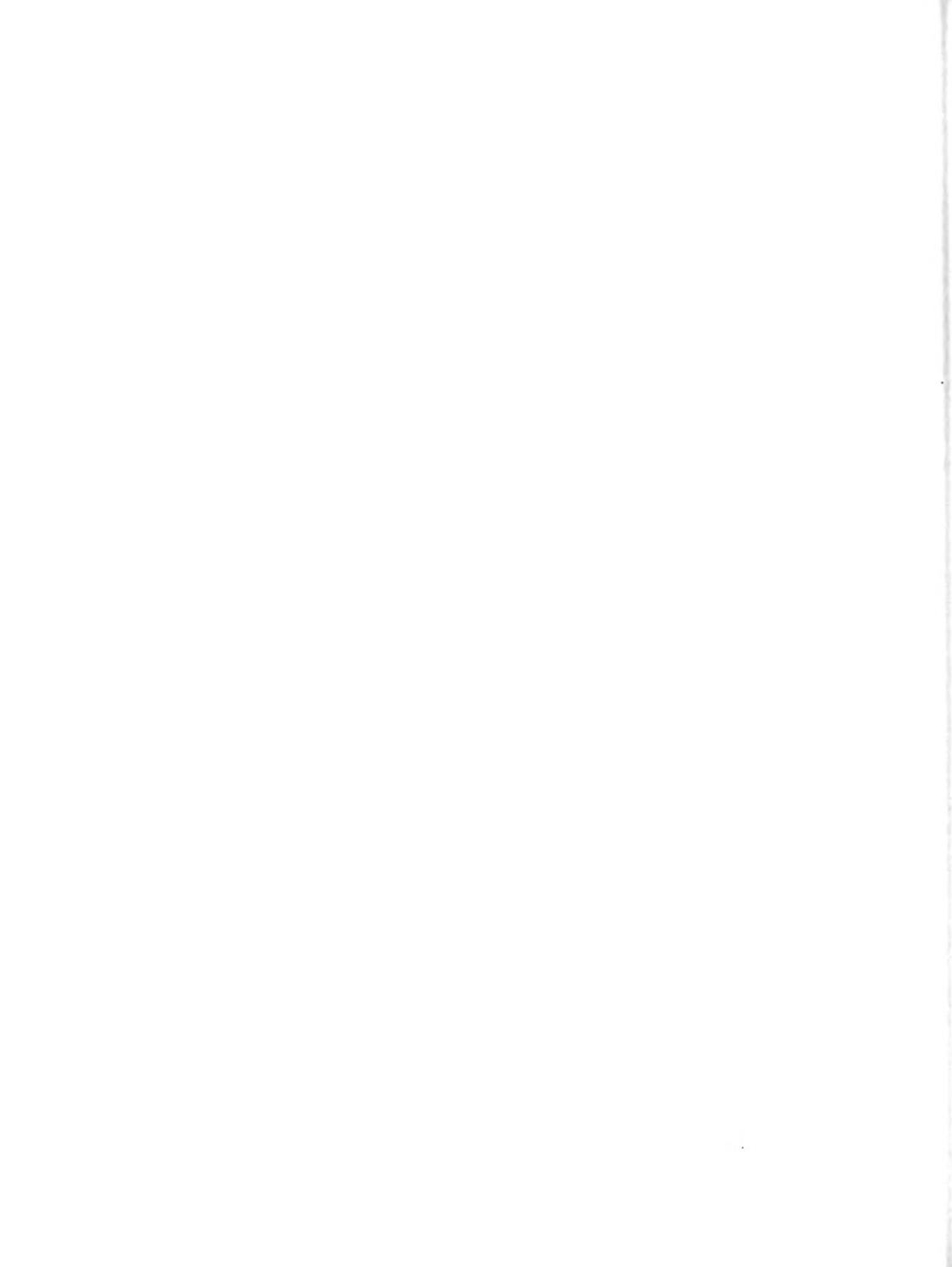
## PREDOMINANT SOIL TYPES



### LEGEND

- WEBSTER
- CLINTON
- GRUNDY
- MUSCATINE
- FAYETTE
- CLARION
- LANOURE
- MARIHALL
- WELBY
- KNOX
- CARRINGTON
- TAMA
- LINDLEY
- WADSWORTH

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## LARGE HOLDINGS ACQUIRED BY CREDITORS THROUGH FORECLOSURE

### Western Meat Producing Area

This problem is relatively unimportant in the Western Meat Area, there being only six counties that have townships with 15 per cent or over of corporate owned land. The townships include: one in Lyon, Three in Plymouth, five in Woodbury, one in Ida, four in Monona, and two in Fremont, or a total of only fifteen townships in the whole Western Meat Production Area.

Refer to Figure 1030-3 for more specific location of these townships as well as of those located in other sections of the state.

### Southern Pasture Area

Class problem 3c is found in all the counties in the Southern Pasture Area except four - Adams, Lucas, Marion and Henry. However, the problem is not serious in the northern half as the high concentration of corporate holdings is in the lower two tiers of counties and centered in Ringgold, Decatur, Wayne, and Clarke counties. However, Taylor, Union, and Madison have four or more townships apiece with over 15 per cent corporate land, and so should be included in the problem area. The townships in the other counties are scattered, so will be disregarded. The seven counties; Taylor, Ringgold, Union, Decatur, Clarke, Wayne, and Madison, will constitute the problem area in the Southern Pasture Area. There are in these seven counties, 59 townships in this class problem: six in Taylor, ten in Ringgold, four in Union, fifteen in Decatur, eight in Clarke, ten in Wayne,

PER CENT CHANGES IN RURAL POPULATION FROM 1920-1930

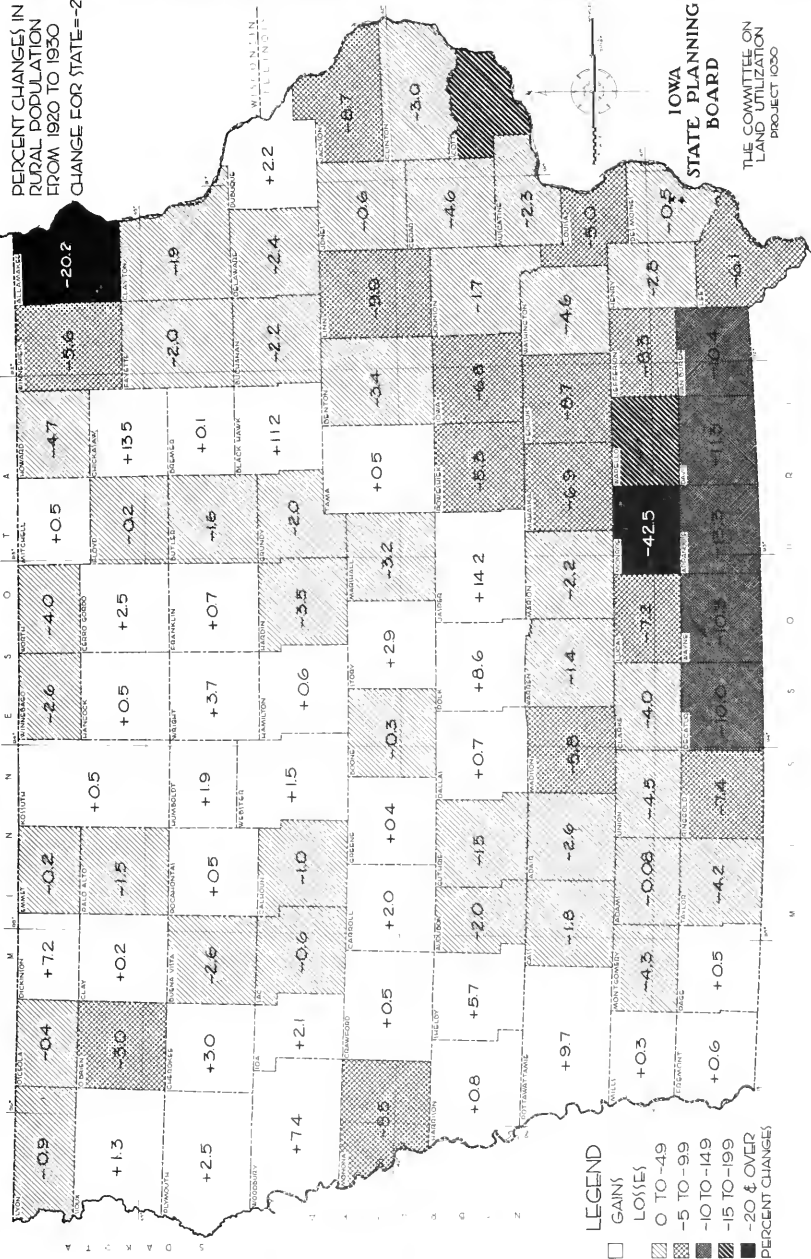
Fig. 1030-24

The counties in white are those in which the rural population increased from 1920-1930. The counties which are shaded decreased in rural population. The average decrease was 2.4 per cent. With a few exceptions, the counties having high producing soil had an increase or a very small decrease in rural population. The poorer soil regions such as the southern part of the state showed a decrease, usually over 10 per cent. In Monroe County the decrease was 42.5 per cent. This can be partially attributed to a suspension of coal mining operation.



# IOWA STATE PLAN CHANGE IN RURAL POPULATION

PERCENT CHANGES IN  
RURAL POPULATION  
FROM 1920 TO 1930  
CHANGE FOR STATE = -2.4%



1030-24



and four in Madison.

#### Eastern Meat Producing Area

There are only ten townships distributed in five counties included in this area. Corporate owned land is relatively insignificant here, as the ten townships are widely scattered throughout the area. Township data are not available for most of the criteria indicating need for adjustment, and county averages show little relative to the few townships in this area.

#### Dairy Area

In this area there are 28 townships distributed in nine counties: three in Winnebago, two in Worth, two in Mitchell, seven in Howard, six in Cerro Gordo, two in Floyd, two in Chickasaw, two in Fayette, and two in Buchanan. There is no marked concentration in this area, yet 24 out of the 28 townships fall within seven counties in the upper two tiers of counties to the west edge of this area. However, the townships are rather widely scattered within these counties.

#### Cash Grain Area

This class problem falls within 15 of the 21 counties in this area but there is a marked concentration of corporate holdings in the upper two tiers of counties where a general farming program is more nearly followed than is a cash grain program. The counties with the high concentration of corporate lands are adjoining Osceola, Dickinson, Clay, Emmet, Palo Alto, Kossuth, and Hancock. There are 44 townships in these seven counties that

# DRAINAGE INVESTMENT PER ACRE

Fig. 1030-25

The northeastern and east central parts of the state had high capital investments per acre in drainage enterprises in 1930; most of the counties had above the state average of \$12.62. The average capital investment for the whole Dairy Area was between \$20 and \$29.90 per acre. Allamakee had \$23; Black Hawk, \$26; and Mitchell, \$22. In the east central area Poweshiek had \$29; Mahaska, \$22; Iowa, \$20; Washington, \$21; and Marshall, \$15. Lee County had an investment of \$49 per acre. The Cash Grain Area averaged rather low, as did the Southern Pasture Area. Generally speaking, the western part of the state was low, although there were scattering counties well above the state average such as Audubon, having a \$30 per acre investment, and Crawford with \$22.

## IOWA STATE PLAN





constitute this class problem area. However, because of the small difference in farming practices and soil types it seems advisable to consolidate the two contiguous areas, the Cash Grain Area and the Dairy Area, into one large area. This area includes 14 counties comprising 72 townships, all in the upper two tiers of counties extending from Osceola County on the west to Howard and Chickasaw counties on the east. The whole area will be designated as the General Farming Area as applied to the problem of corporate ownership.

#### CHARACTER OF PROBLEM AND POSSIBLE MEANS OF ADJUSTMENT

All townships in the state where 15 per cent or more of the land is corporate owned are classified as problem area 3c.

This classification applies in all five of the major farming type areas, but is of extreme consequence in only the Southern Pasture Area and the General Farming Area in the northern two tiers of counties. There is a rather marked concentration even within limited sections of these two areas. Relatively heavy loans on low value land account, in a measure, for the concentration of corporate land in these two sections. In other words, a larger percentage of the land value was loaned here when land values were below the state average. The state average for corporate land in 1933 was 7.9 per cent of the total land and the average land value for 1930 was \$124 per acre. The average land value for the seven counties in the Southern Pasture Area for 1930 was \$84, and the average per cent of corporate owned land was 16.4.

# EXTENT AND DEGREE OF SOIL ACIDITY

Fig. 1030-26

The shaded portions on this chart show the degree of acidity, or the lime requirements per acre, and the figures show the extent or per cent of acid soils in each county. The tier of counties along the Missouri River, and the area in the central part of the state have the lowest lime requirement, less than two tons per acre. The highly acid soils are in the southern part of the state and scattered counties in the eastern part of the state, these needing over four tons per acre. Limestone is available in lesser quantity in southern Iowa than in some other sections of the state.



# SOIL ACIDITY



0-1½  
2-3½  
4 & OVER

NOTE  
FIGURES DESIGNATE PERCENTAGE OF THE OIL THAT IS ACID

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1030-26



Southern Pasture Area

County	:	1930 Land Value	:	1933 Per cent
	:		:	Corporate Land
Clarke		\$ 78		20.2
Decatur		62		26.0
Madison		106		11.1
Taylor		101		12.4
Union		100		11.3
Ringgold		75		16.4
Wayne		68		21.2
Average		\$ 84		16.4
State Average		\$124		7.9

The above table shows that every county in this area is below the state average in land values, and has a much higher per cent of corporate land.

USE OF CROP LAND

Fig. 1030-27

This map gives the percentage of total crop land used for each crop by districts.

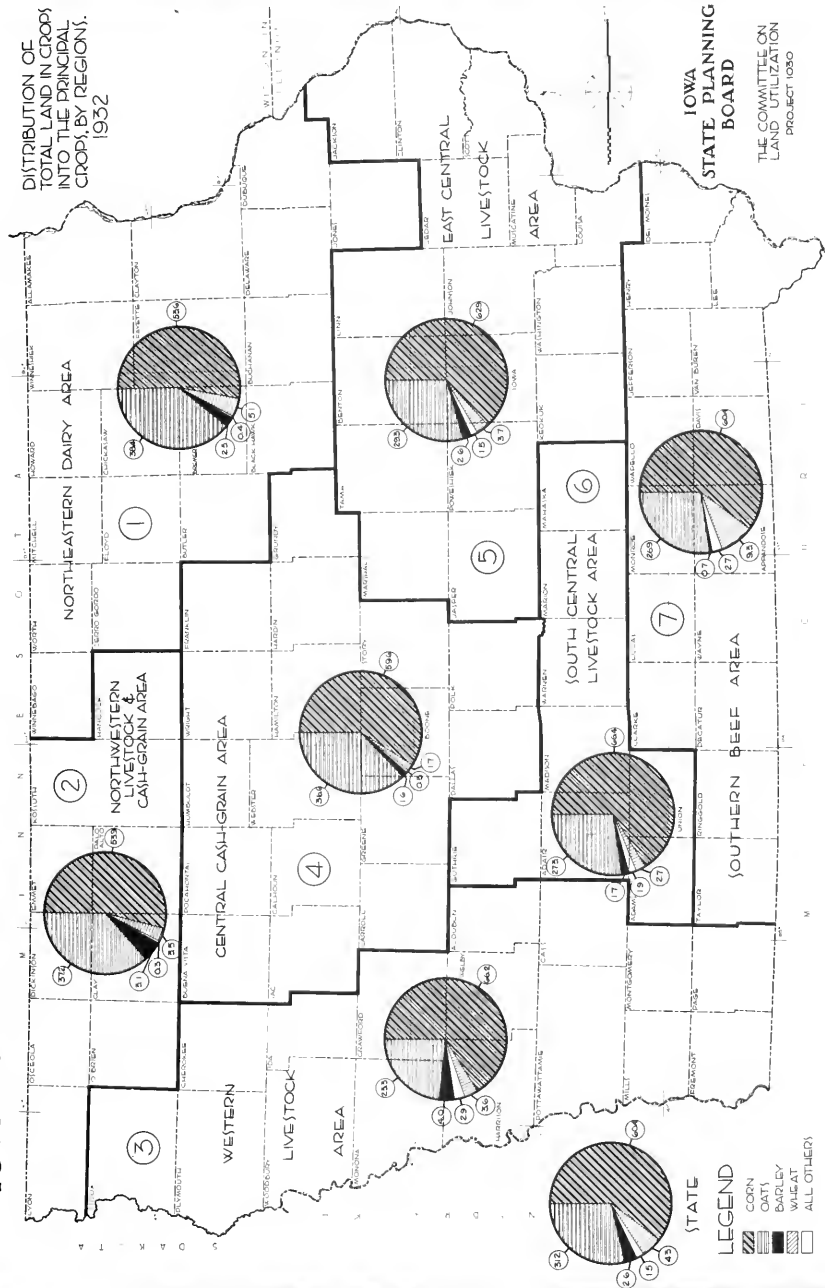
# IOWA STATE PLAN

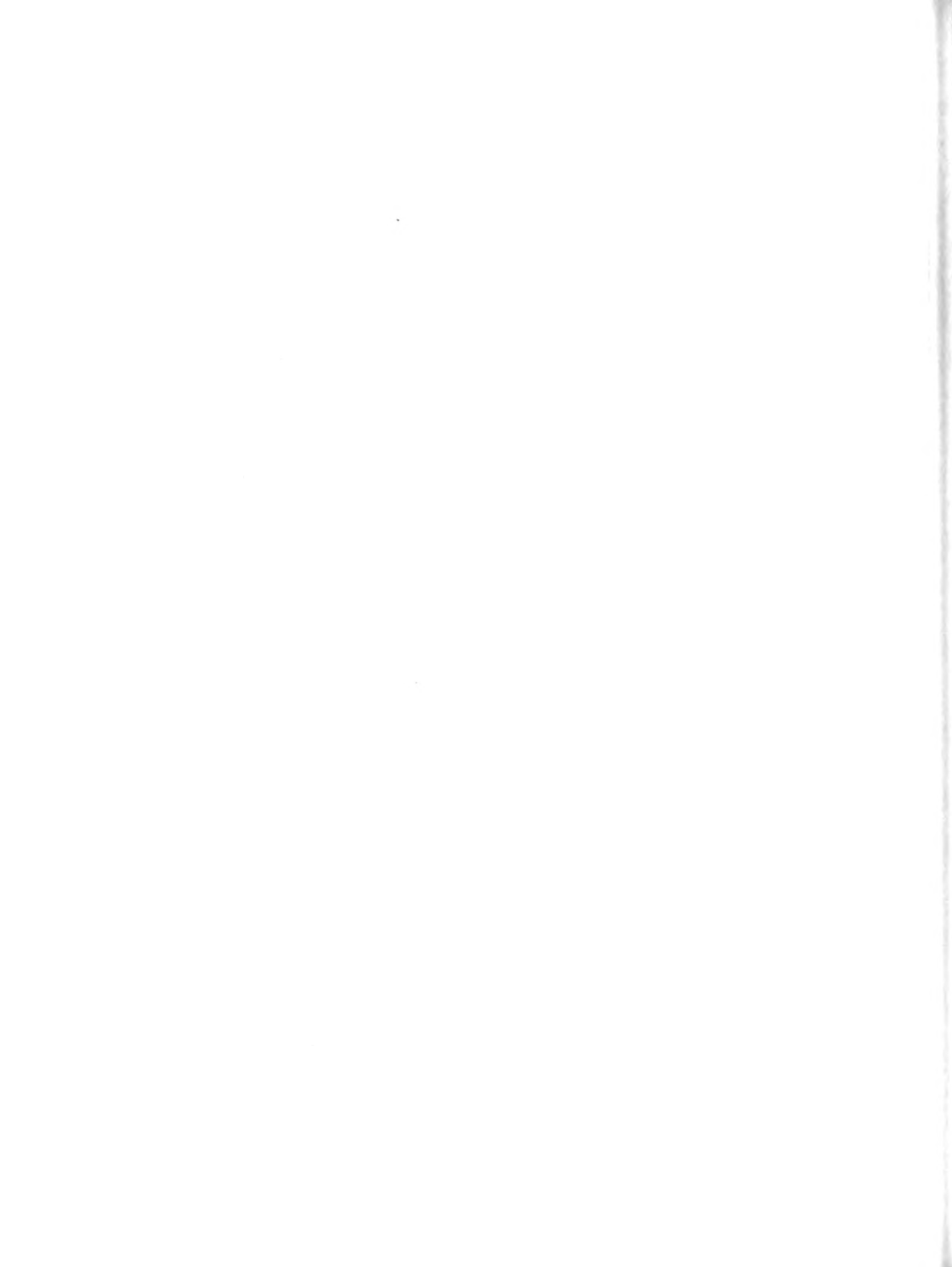
## USE OF CROP LAND

DISTRIBUTION OF  
TOTAL LAND IN CROPS  
INTO THE PRINCIPAL  
CROPS BY REGION,  
1932

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1030-27





General Farming Area

County	:	1930 Land Values	:	1933 Per cent Corporate Land
Osceola	:	\$124	:	11.3
Dickinson	:	109	:	18.1
Clay	:	131	:	10.6
Emmet	:	110	:	13.5
Palo Alto	:	119	:	17.7
Kossuth	:	125	:	13.5
Winnebago	:	112	:	10.7
Hancock	:	125	:	9.2
Worth	:	103	:	9.0
Cerro Gordo	:	115	:	14.5
Mitchell	:	103	:	8.4
Floyd	:	116	:	8.9
Howard	:	85	:	14.4
Chickasaw	:	92	:	10.0
Average	:	\$112	:	12.1
State Average	:	\$124	:	7.9

This again shows practically the same results as the preceding table. The land values were taken from Figure 1030-20, and the corporate land figures come from Figure 1031-7.

The counties in these two areas are in direct contrast with Scott

# FARM TENANCY

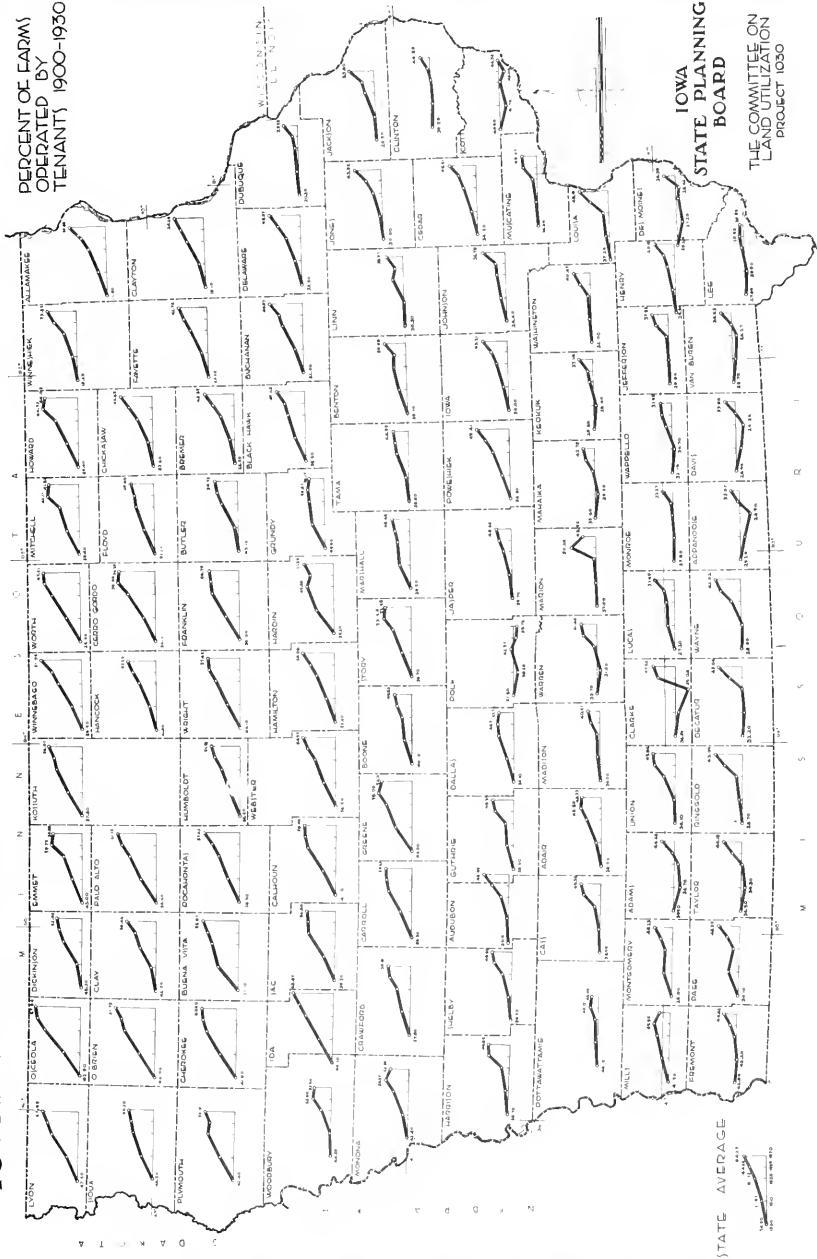
Fig. 1030-28

The years under consideration in this map are 1900, 1910, 1920, 1925, and 1930. There has been a gradual increase in tenancy for the state average from 34.9 per cent in 1900 to 47.27 per cent in 1930. There has been a gradual increase for the first three periods, with the exception of the southern counties, there being a marked increase in the northern half of the state. A gradual decrease can be seen in the southern two tiers of counties for these first three periods. The per cent of tenancy increased from 1925 to 1930 in the southern part of the state, and decreased in the northern half of the state for the same period.



# FARM TENANCY

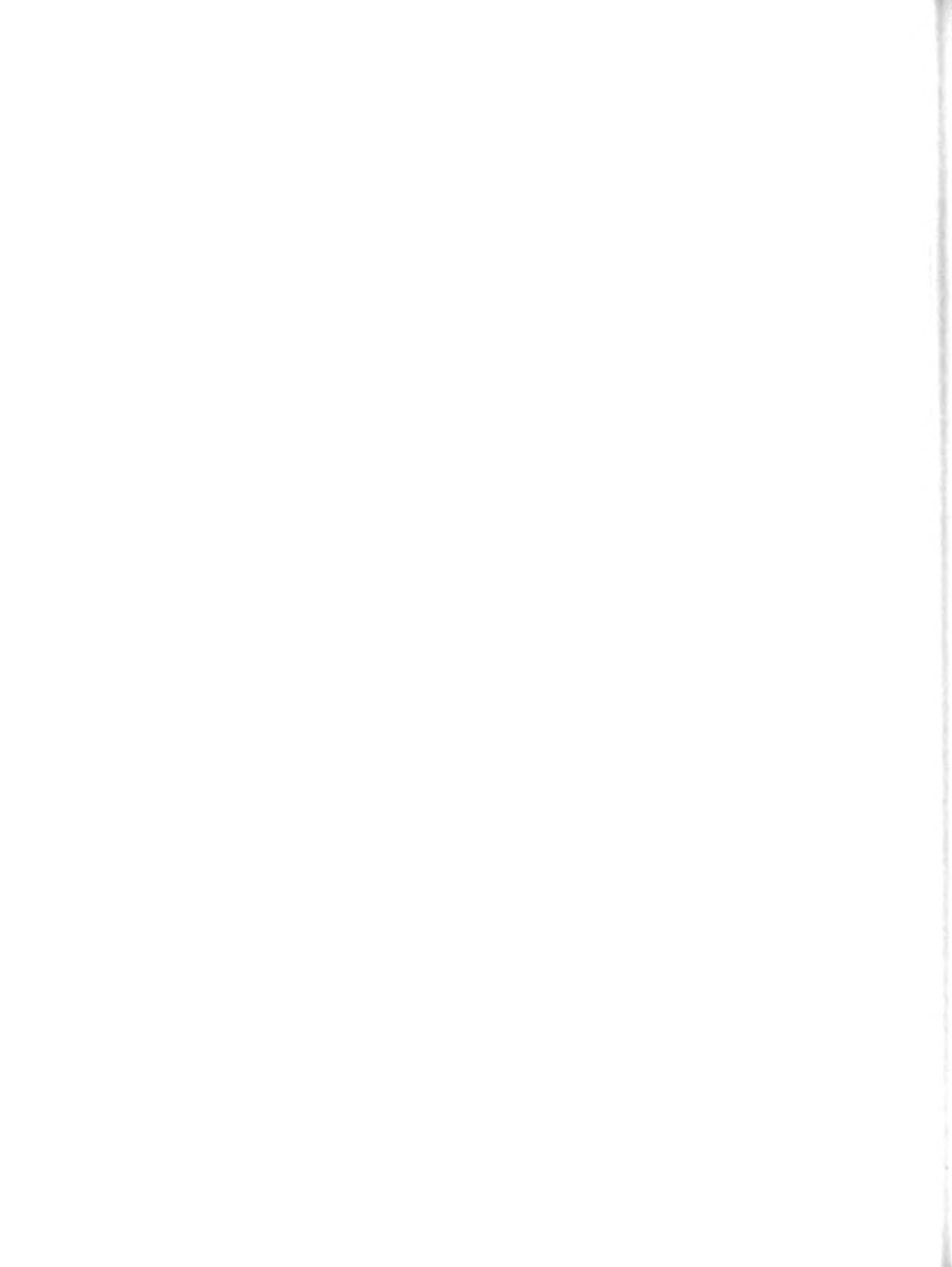
PERCENT OF FARMS  
OPERATED BY  
TENANTS 1900-1930



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1030-28



County which had an average land value of \$173 in 1930 and 3.5 per cent of the land in corporate holdings.

Some of the reasons for the low value of land in these two areas might be of interest to note. In the Southern Pasture Area the great majority of the soil is of the Grundy and Shelby types. There is also some scattering Lindley, Lamoure, Muscatine, Webster, Marshall, Clarion and Tama. Ninety-five per cent of the soil in these counties is acid, and all of it needs over two tons of lime; most of it needs over four tons to neutralize the acidity. Needless to say this hinders the growing of legumes, and would curtail a good cropping system. Much of the land is rolling and all of it is subject to severe erosion. The average feed unit production per acre is 17.9, which is considerably below the state average of about 24, and even below the average of the Southern Pasture Area of 19.5 feed units per acre. The predominant soil types in the General Farming Area are Webster, Clarion and Carrington. All of these types are quite productive, yet some in this area are not as productive as the same soil types in the central part of the state, as a higher percentage of the soil is acid, and the lime requirement is higher. Seventy-nine per cent of the soil in this area is acid, and the average lime requirement is from 2 to  $3\frac{1}{2}$  tons per acre. See Figure 1030-26.

The topography is rougher, especially in the eastern half of this area, than in the central part of the state, having generally the same soil types. The average drainage investment for these 14 counties is \$15.50 per acre as compared to \$12.62 for the state average.

TAX DELINQUENCY BY TOWNSHIPS - 1928

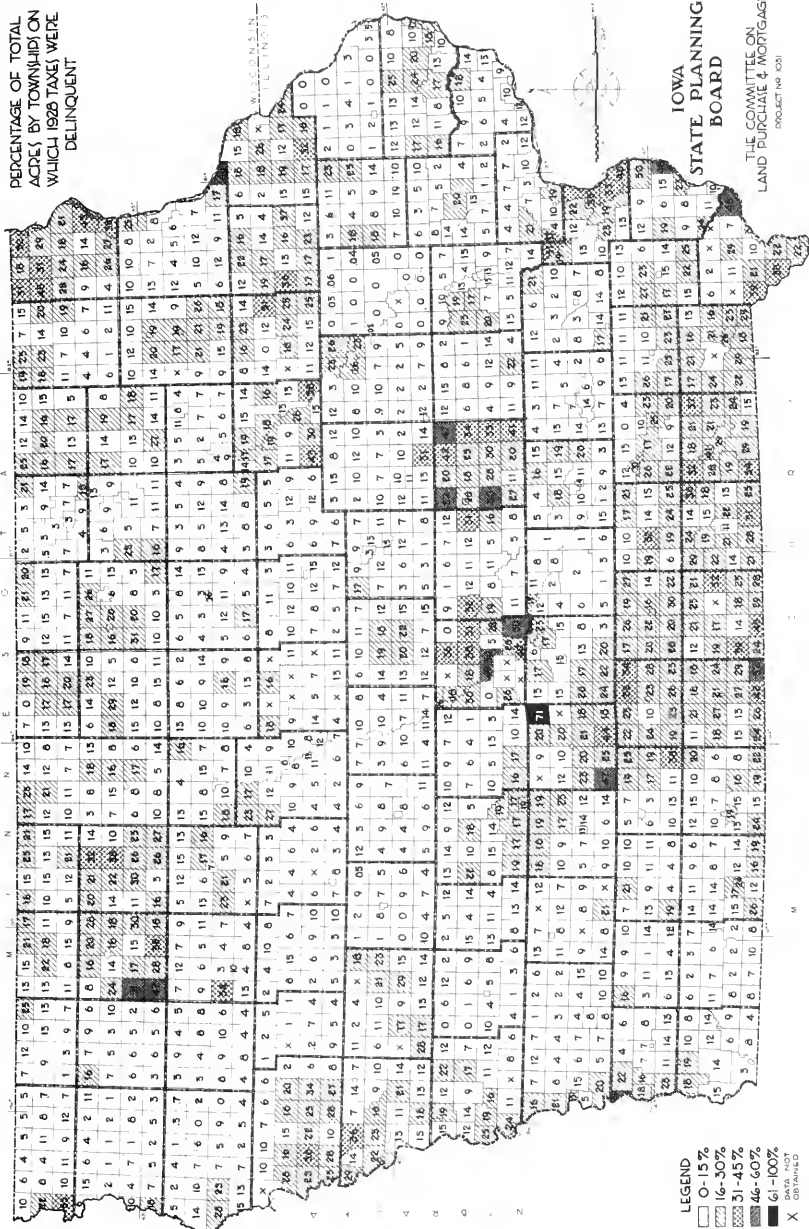
Fig. 1031-1

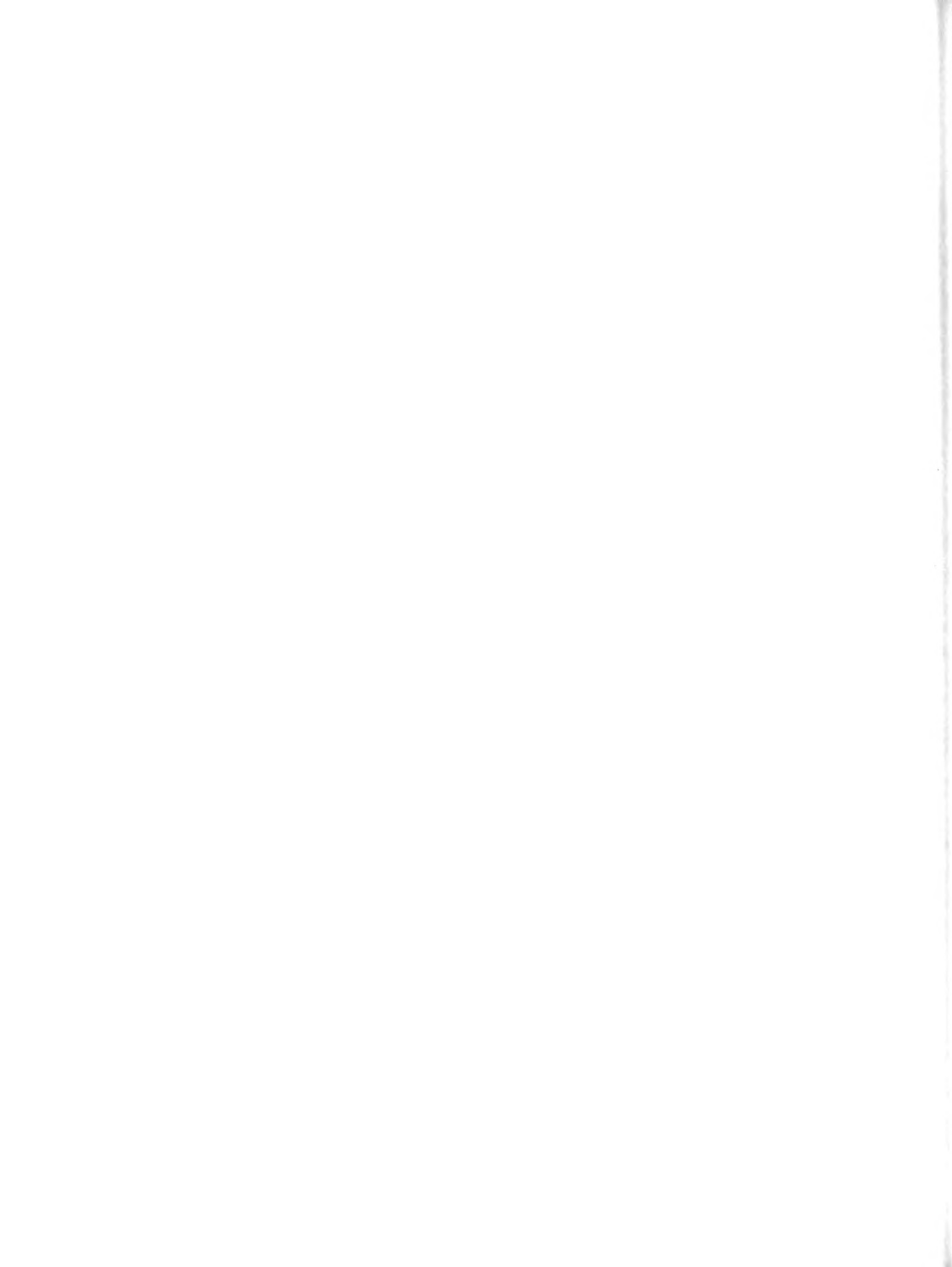
The percentage of the total acreage in each township on which 1928 taxes were delinquent is shown. Shaded areas have the highest delinquency. In general, the greatest concentration of tax delinquency is in areas where soil erosion is most severe, where over-valuation of land has been most extensive or where unfavorable agricultural conditions prevail. The average delinquency by townships for the state in 1928 was 13 per cent.

# IOWA STATE PLAN

# 1928 TAX DELINQUENCY

PERCENTAGE OF TOTAL  
ACRES BY TOWNSHIP ON  
WHICH 1928 TAXES WERE  
DELINQUENT





Good farms were under-evaluated. The poorer farms were the first to be foreclosed, but by now many of the good farms have also gone through foreclosure. It is evident that bank failures helped to bring on this situation, especially on the better farms in the General Farming Area, as many people owned bank stock which involved them in payment of double liability as well as of mortgages held by banks.

This was especially true of thrifty farmers. They had to mortgage their farms to raise this money and then could not keep up the payments.

Another reason for the high concentration of corporate lands in these two areas is the fact that the banks and insurance companies have made funds more readily available here than in other sections of the state.

Corporations, especially insurance companies, were willing to loan money almost any place in the state with one possible exception; in parts of eastern Iowa. The reason corporations escaped large holdings here is that they did not lend extensively in this region, which was better supplied with local funds than were other sections of the state. In certain isolated localities loans may have been more available than in others. Speculative activity has also entered the picture.

Another possible reason for over-valuation of land is that the loan correspondent was paid on a commission basis. The larger the loan the higher his commission. It was to his personal benefit to loan the maximum on the farm.

A study of the policies of insurance companies of the state as a whole has been made from the data of the Insurance Commission of the State

TAX DELINQUENCY BY TOWNSHIPS - 1929

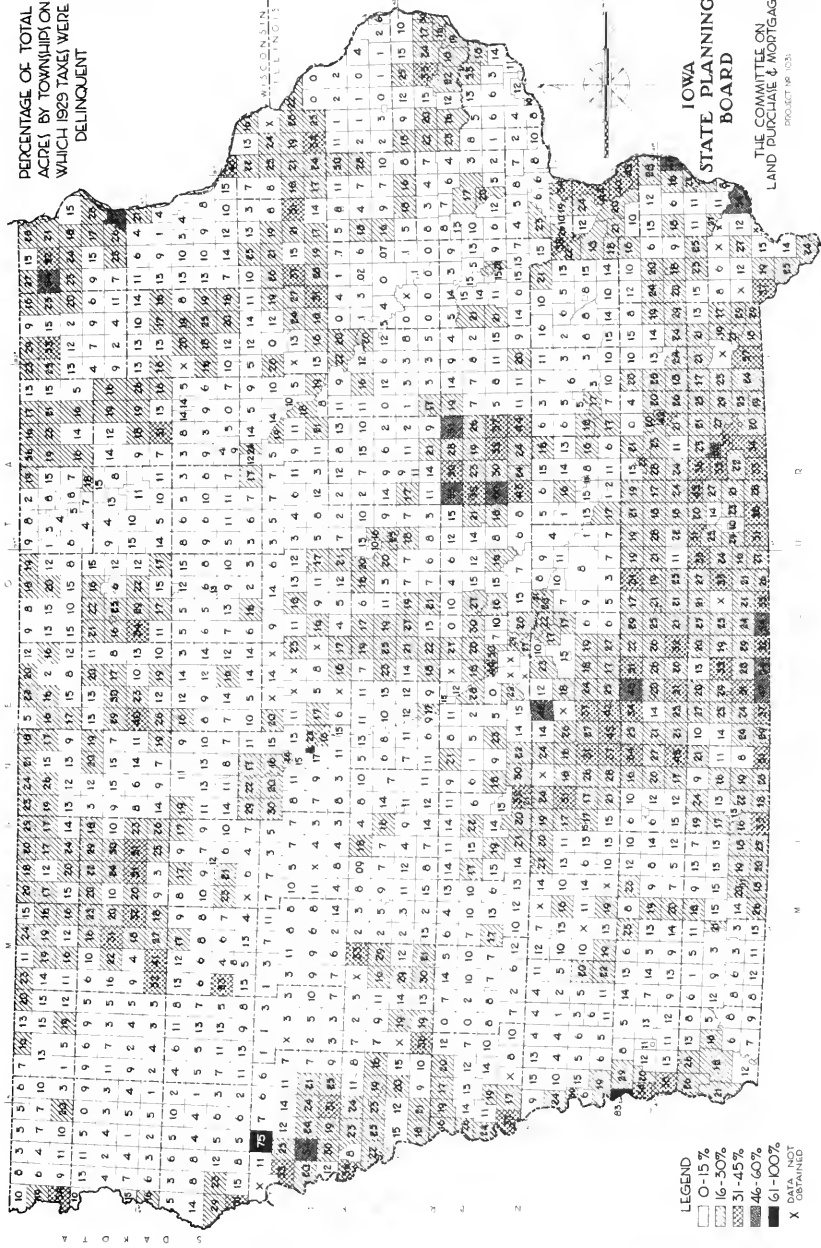
Fig. 1031-2

This chart gives the percentage of the total acreage in each township on which 1929 taxes were delinquent. Compared to the delinquency in 1928, an increase is indicated in areas of highest previous delinquency. The areas of highest delinquency increased in extent due to the tension of economic conditions and their effect upon the expansion of marginal and sub-marginal lands. The state average was 14 per cent.



# IOWA STATE PLAN

# 1929 TAX DELINQUENCY



1031-2



of Iowa. Insurance companies did not institute suits for foreclosure as soon as private investors and other corporations. These other creditors foreclosed on a higher per cent of their farms during the period from 1922 - 1930 than did the insurance companies. Seventy per cent of insurance company foreclosures during the period from 1915 - 1933 came in the last three years, 1931, 1932 and 1933, while only 25 per cent of the private investors' foreclosures came during this same three year period. This study also shows that insurance companies had the money available to finance foreclosures and to manage the farms after they had taken them over.

#### RECOMMENDATIONS

It is a difficult task to submit accurate recommendations to solve the corporate holdings situation. It is a new problem in Iowa, and has not been studied completely enough to allow specific recommendations.

However, there have been several proposed plans. The advisable thing is to get the land out of the hands of its unwilling owners, the corporations, into the hands of farmers who wish to own their own farms.

These institutional land-owners cannot be expected to sell their land at a price based on the level of present farm incomes because, in many cases, such a value is below the amount of the loan, and furthermore there are reasons for believing that the level of farm incomes will rise. Purchasers, likewise, are not willing to pay more than incomes warrant because the commonly expected rise in farm price is very uncertain and if the rise should not come their position would be much better as tenant farmers. In

TAX DELINQUENCY BY TOWNSHIPS - 1930

Fig. 1031-3

The percentage of the total acreage in each township on which 1930 taxes were delinquent is herein shown. As compared to delinquency in 1928 and 1929 a sharp increase is indicated over the entire state. The state average for tax delinquency in 1930 was 22 per cent. Again the greatest increase is shown in the areas of most extensive over-valuation of land, most severe erosion and unfavorable agricultural conditions.

# IOWA STATE PLAN

## 1930 TAX DELINQUENCY

PERCENTAGE OF TOTAL  
ACRES BY TOWNSHIP ON  
WHICH 1930 TAXES WERE  
DELINQUENT

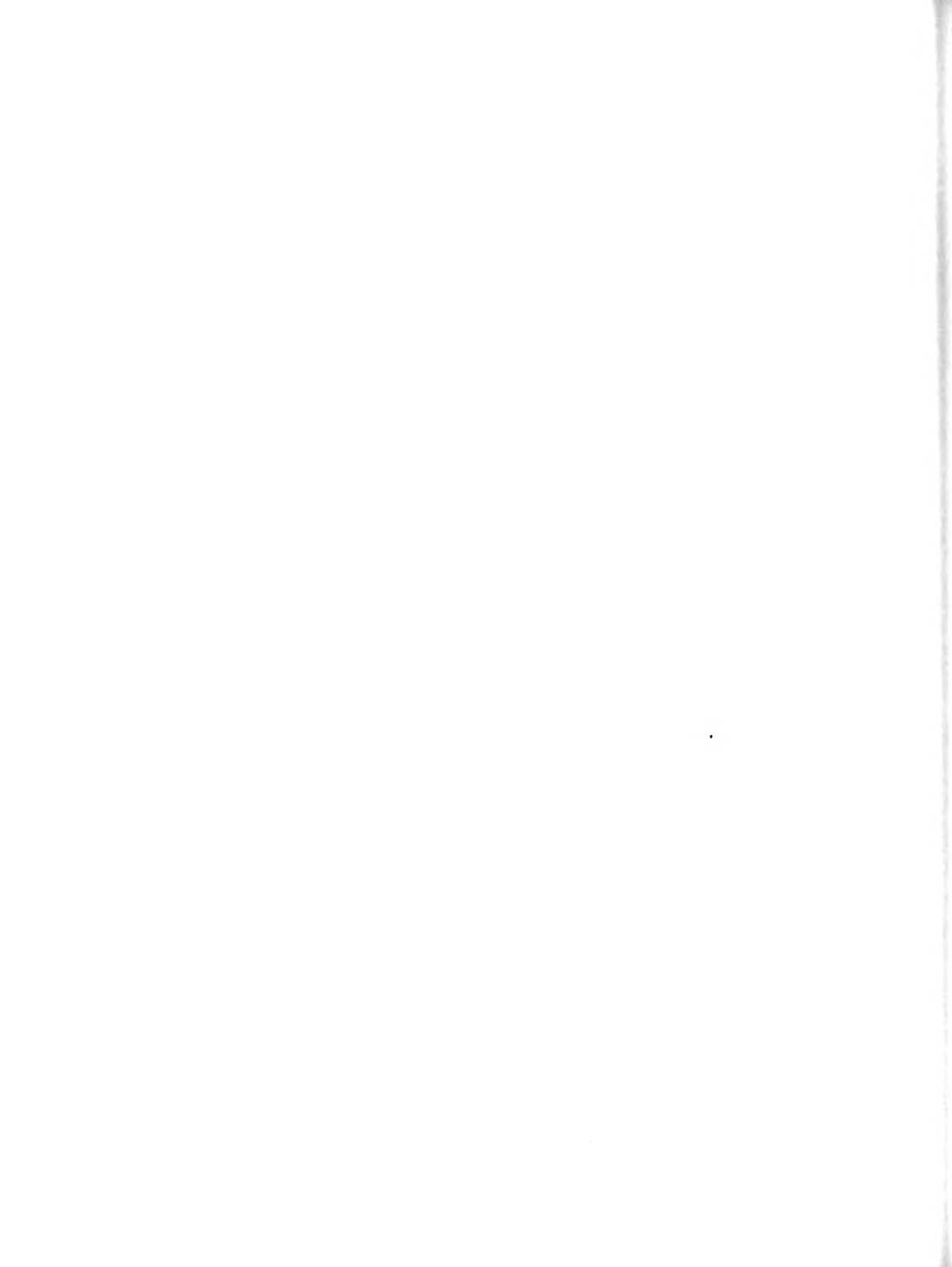
LEGEND  
 0-15 %  
 16-30 %  
 31-45 %  
 46-60 %  
 61-100 %  
 X  
 DATA NOT  
 AVAILABLE

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LAND PURCHASE & MORTGAGE

EXPLANATION

1031-3



short, it is impossible to forecast the future upon which value depends, and under present plans of paying for farm land neither buyers nor sellers are willing to take the risk.

Five plans, suggested here for selling corporate land to private individuals, are all based on a sliding scale basis adjusted to several factors, namely: principal payments, interest payments, total payments, unpaid balance of principal and rate of interest. These five plans with fixed, adjusted and variable factors are given in tabular form below.

PLAN	FIXED FACTORS	ADJUSTED FACTORS	VARIABLE FACTORS
1	Principal Rate of interest	Annual payments on principal	Length of time Amount of interest
2	Principal Amount of interest	Total annual payment	Length of time Rate of interest
3	Principal Length of time	Annual payment of interest	Rate of interest Amount of interest
4	Length of time Rate of interest	Total annual payment	Amount of principal Amount of interest
5	Length of time Rate of interest	Payment made in products or their equivalent value in cash	Value of products

Plan No. 1 requires the buyer to pay more on the principal in case prices rise, and automatically lowers the amount and extends the time in case prices are lower. The increase or decrease, from originally estimated payments, is in direct proportion to changes in the farm price level. In applying this plan to a farm sale a value and interest rate would be determined. An estimate of the length of the contract according to present prices would be made, and the amount of principal payment necessary each

TAX DELINQUENCY BY TOWNSHIPS - 1931

Fig. 1031-4

This map gives the percentage of the total acreage in each township on which 1931 taxes were delinquent. A decided increase over the entire state is evident. The state average rose from 22 per cent in 1930 to 37 per cent in 1931. The greatest increase came in areas severely affected by erosion, over-valuation of land, or unfavorable agricultural conditions.

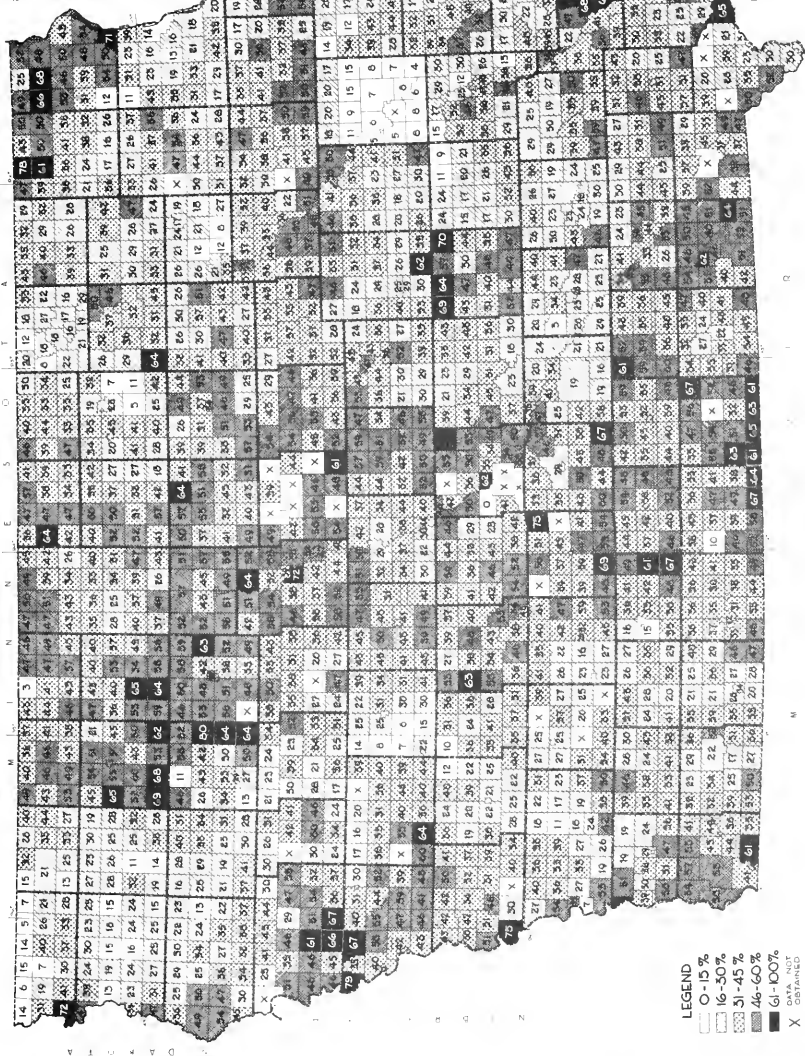


# IOWA STATE PLAN

1931

# TAX DELINQUENCY

PERCENTAGE OF TOTAL  
ACRE BY TOWNSHIP ON  
WHICH 1931 TAXES WERE  
DELINQUENT



LEGEND  
 0-15%  
 16-50%  
 51-45%  
 46-60%  
 61-100%  
 X

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LAND PURCHASE & MORTGAGE  
PROJECT NO. 1031

1031-4



year to amortize the loan in the time would be estimated. In case at the date of payment the average of the indices is less than at the time of purchase, the amount of principal upon which interest is paid will be lowered and the payment period will be extended. In case farm prices are higher than at the time of purchase, the loan will be paid off before the estimated time has elapsed.

Plan No. 2 provides for fixing the amount of the total obligation, amount of principal and interest. The annuities will be adjusted in proportion to the price levels. In applying this plan the amount of capital, length of time under present conditions, and the rate of interest will be determined. The contract will stipulate that the amount of payment each year is to be adjusted depending upon the price index, and that the length of time will extend until, by adjusted payments, a stipulated number of dollars has been paid.

Plan No. 3 assumes that the seller is willing to make some adjustment on the amount of return from the loan, but that he is anxious to have the sale "stick"; he wants the capital to be reduced each year to secure his loan. This plan differs from Plans No. 1 and 2 principally in that there is no provision made for the automatic extension or contraction of time. It actually operates on the principle that, were prices to fall, the value of the property would be lowered and a fixed interest rate would supply the same amount of interest as if the value remained fixed and the rate of interest were reduced in like proportion. In other words, the plan provides for a fixed interest rate on a reappraisal each year without altering the

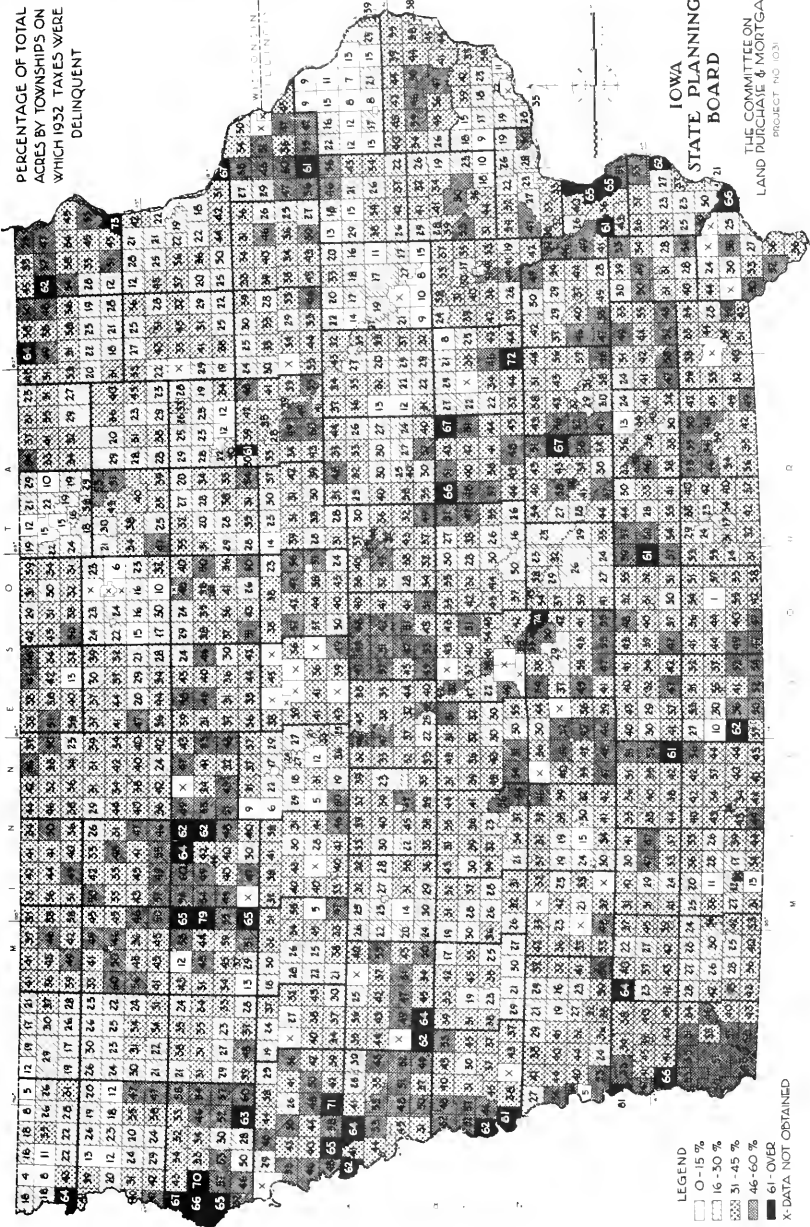
TAX DELINQUENCY BY TOWNSHIPS - 1932

Fig. 1031-5

Herein is given the percentage of the total acreage in each township on which 1932 taxes were delinquent. There was a general decrease of one per cent in tax delinquencies from 1931 to 1932 for the state. However, in the areas in which the highest concentration of tax delinquency prevailed previously, the greatest decreases occurred due to foreclosure on mortgages by corporations and their payment of accrued taxes.

# IOWA STATE PLAN 1932 TAX DELINQUENCY

PERCENTAGE OF TOTAL  
ACRES BY TOWNSHIPS ON  
WHICH 1932 TAXES WERE  
DELINQUENT



LEGEND  
 0-15 %  
 16-30 %  
 31-45 %  
 46-60 %  
 61-75 %  
 X-DATA NOT OBTAINED

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amount of the obligation.

Plan No. 4 provides that the payment of principal and interest vary directly in proportion to the prices of the ten most important farm products weighted according to their importance. Inasmuch as the rate of interest and length of time are fixed, the plan provides, as stated before, for paying a value in cash each year equivalent to a fixed annuity of products in a like proportion. In applying this plan care must be taken that the appraisal is in line with prices. The contract will state that these annual payments will be subject to change in direct proportion to the farm price index which will complete and not over-satisfy the amount due each year. There is a Supplement to Plan No. 4. Crops rank differently in relative importance in the different farming type areas and also on isolated farms. This Supplement applies in such cases; different weights can be used but still the principle holds, although a differently weighted width is used. In the original plan the Iowa Farm Price Index is used.

Plan No. 5 is called the crop share purchase plan. This plan is the ultimatum in the application of the theories of actual value of the farm and the purchaser's ability to pay. In such a plan the contract would contain no variables or factors to be adjusted. The amount received by the seller depends upon the size of the crop and the price of the products. It will first be necessary to find out the per cent of the crop or various crops the property is worth in rent. If the farm is good, the crop share rent may be 60 per cent of all crops, or if it is rather poor, it may be down to 40 per cent. Then it will be necessary to determine what percentage

# LAND VALUES BY TOWNSHIPS

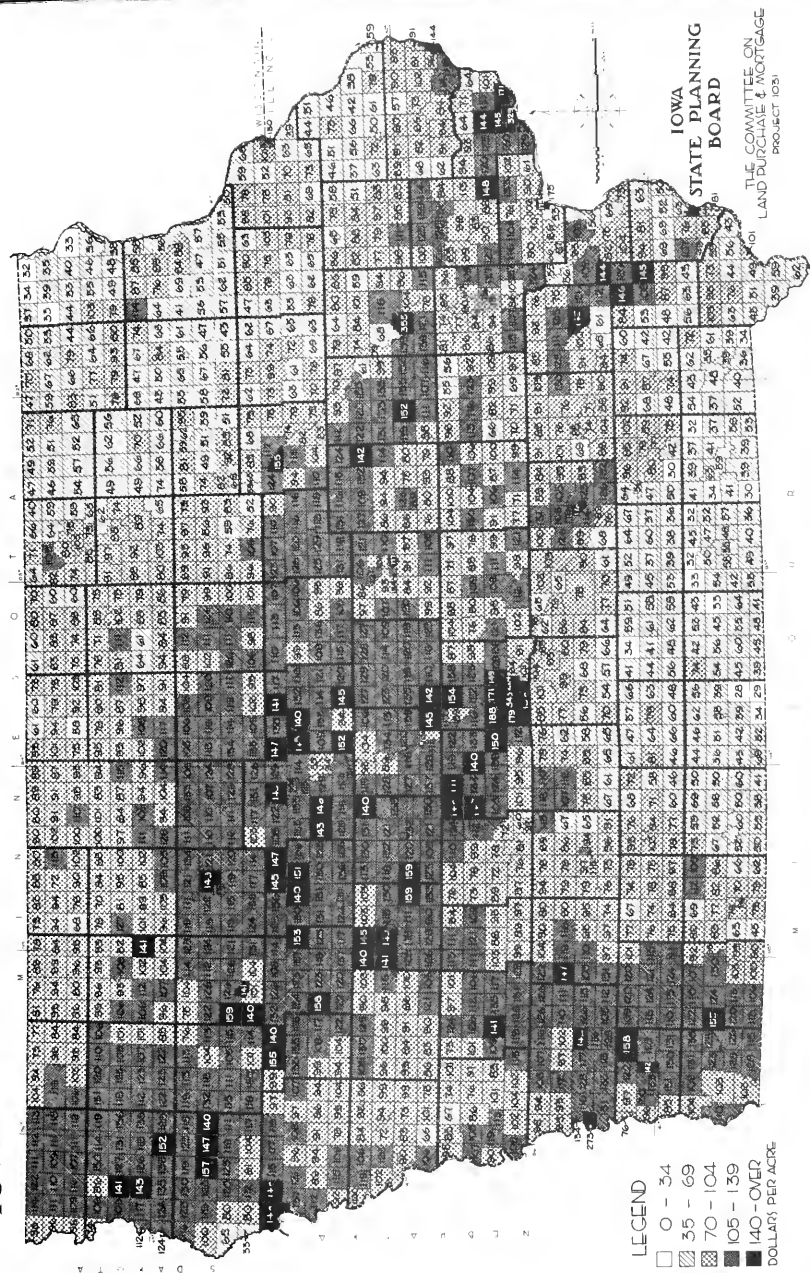
Fig. 1031-6

Land values by townships are herein shown. Values of buildings are not taken into consideration. The southern and northeastern sections of the state had the lowest land values per acre in 1930, ranging from \$35 to \$69. The north central and east central ranged from \$70 to \$104 per acre. The western part of the state was predominantly from \$105 to \$139, despite a considerable number of townships between \$70 and \$104. The central part of the state had the highest land values; practically every township exceeded \$105, with a few scattering townships over \$140 per acre.



# LAND VALUES

# IOWA STATE PLAN

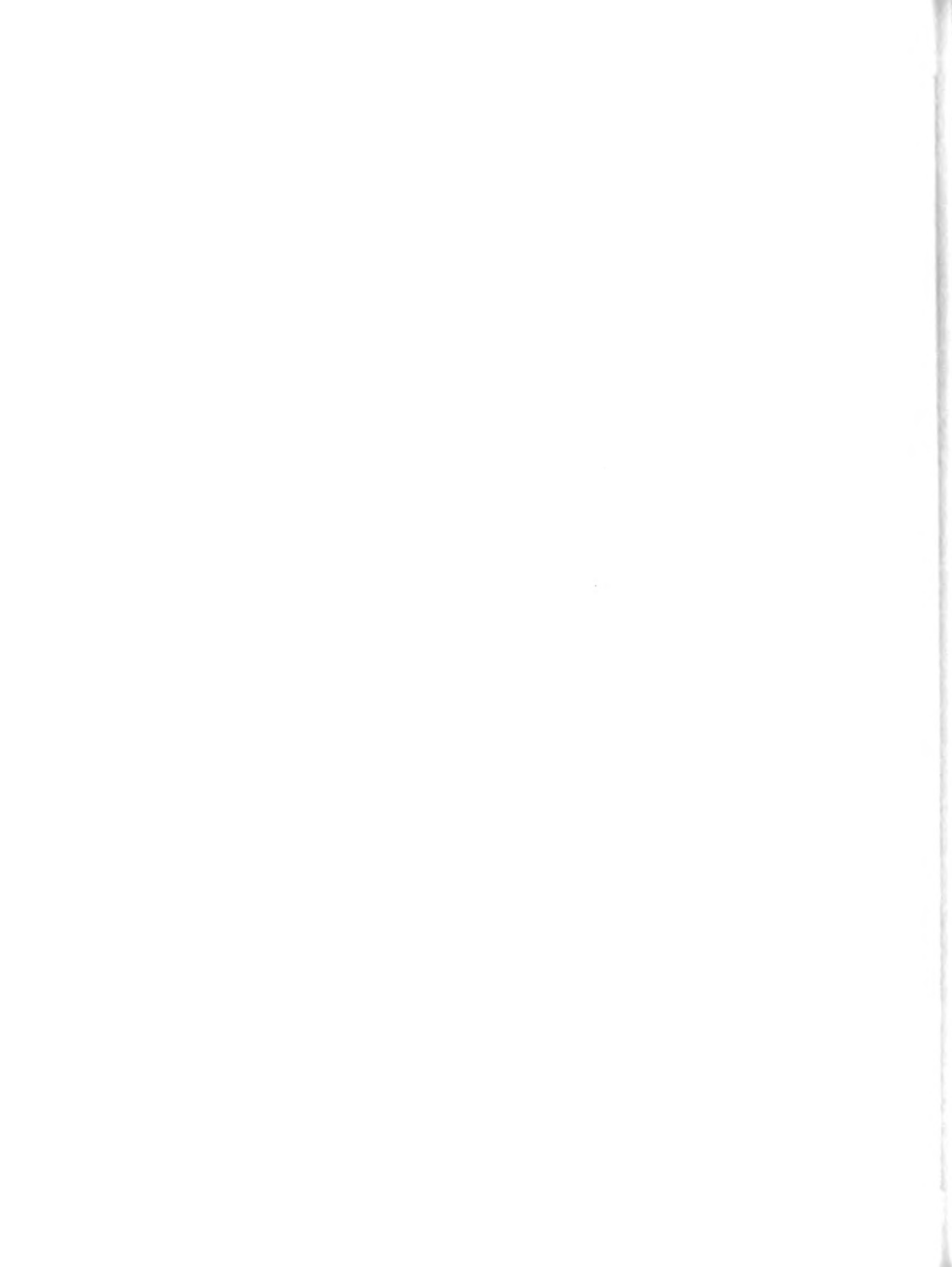


## LEGEND

- 0 - 34
  - ▨ 35 - 69
  - ▩ 70 - 104
  - ▧ 105 - 139
  - 140 - OVER
- DOLLARS PER ACRE

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1031-6



of the value of the farm the rent amounts to. Then this certain percentage remains stable throughout the length of the contract. The seller gets this percentage of the crops each year as his payment. There is a Supplement to this plan also which provides for the cash equivalent of this percentage of crops instead of the actual products. This makes it possible for the crops to remain on the farm where they are produced.

These several basic combinations have been presented with the idea that no one plan will fit the multitude of various conditions. These plans could be applicable for corporations to use in selling their farms to private individuals. Corporations must do something about their farms, as the law requires them to dispose of them after a certain length of time.

Also the government might finance the private purchase of corporate owned lands by capable farmers who are now without land.

#### DRAINAGE PROBLEM AREAS

We have no specific information concerning the over-capitalization of drainage areas in Iowa. According to the 1930 census there were 74 enterprises with approximately five per cent of the invested capital and covering about five per cent of the land in organized districts, reported as in arrears in payment of principal or interest on bonds or other obligations, while the remaining 3,625 enterprises were reported as not in arrears. Reports of 27 enterprises, covering 194,054 acres, show a total of 20,595 acres delinquent in drainage taxes; 3,648 enterprises, covering 5,766,249 acres, reported no delinquency; while 55 enterprises failed to report.

There were 11 pumping stations in Iowa serving land in 10 main

PER CENT OF LAND OWNED BY CORPORATIONS BY TOWNSHIPS

Fig. 1031-7

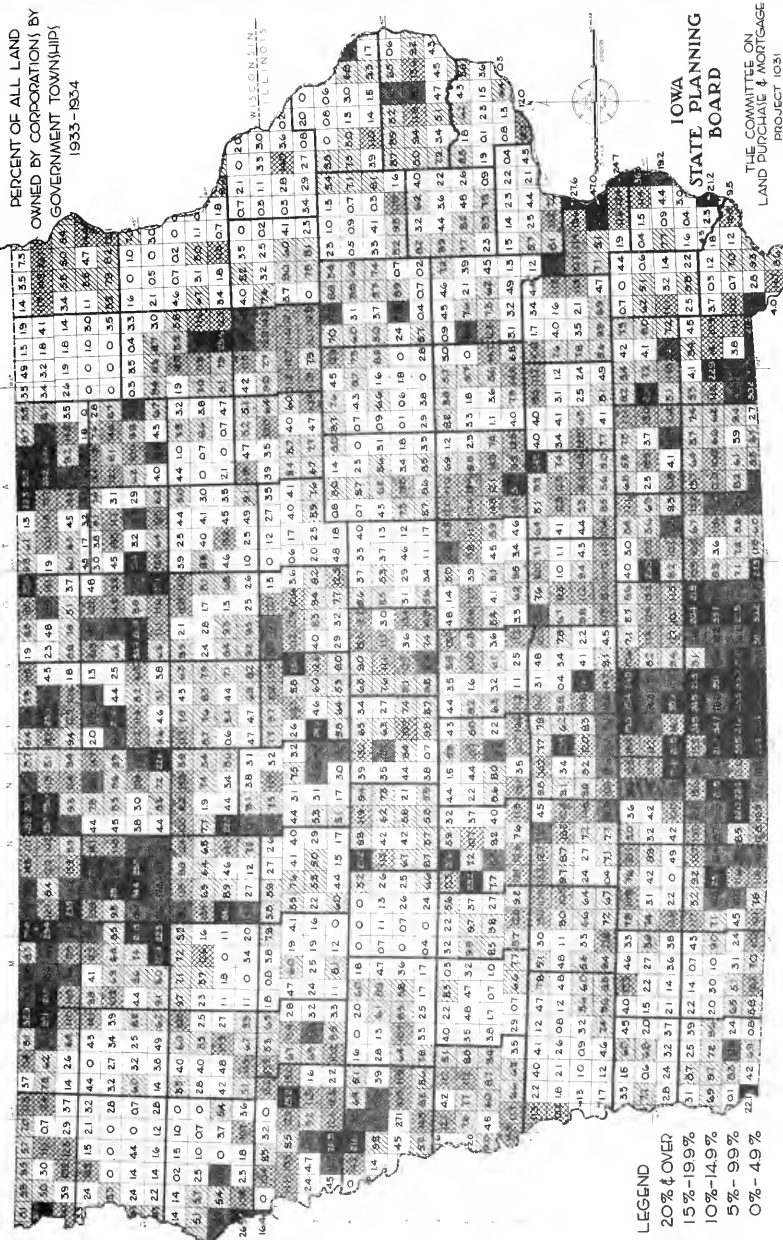
The figures represent for each township the per cent of total acres that was owned by corporations in 1933. There is a high concentration of corporate lands around Decatur, Ringgold, Wayne, and Clarke Counties, and extending into the adjoining counties. There is another region of high corporate holdings in the northern two tiers of counties. Low land values coupled with indebtedness based on over-valuations account in part for the great extent of corporate holdings in both these regions. Comparatively low feed unit production per acre and low soil fertility are also found in these regions.

## IOWA STATE PLAN

# CORPORATE OWNED

# LAND

PERCENT OF ALL LAND  
OWNED BY CORPORATION(S) BY  
GOVERNMENT TOWN(SHIP)  
1933-1934



## LEGEND

20% **↓** OVER?

15%-19.9%

10%-14.9%

1078 14.570

	(	%	)	%	8
	C	%	A	O	B

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PROJECT 1031

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PROJECT 1031



districts and one sub-district. Of these plants two were located in a single district which also included a sub-district. Nine stations were located in the southeastern part of the state near the Mississippi River. Of the two remaining stations, one was located in the southwestern corner of the state in Fremont County, and the other in the northeastern corner of Allamakee County.

The state average for capital invested in drainage enterprises in Iowa is \$12.62 per acre. The average of all counties listed in the 1930 census is \$15.34 per acre, as shown in Figure 1030-25. Considering that \$15.34 is the average, we have a good picture of the districts that have a high investment per acre. We have no information on the amount of delinquency on land and capital invested in drainage enterprises.

In the Western Meat Producing Area: Audubon has a capital investment of \$30 per acre; Crawford, \$22; while Cass, Montgomery and Fremont have \$17 per acre invested in drainage enterprises. The average of all counties in this district is \$13.43.

In the Southern Pasture Area the drainage situation is not of such great importance, due largely to the natural drainageways. This section of the state is much rougher and is interlaced with a large number of rivers and streams. Lee County has a capital investment of \$49, Des Moines, \$18 and Mahaska, \$22 per acre. The large investments in drainage enterprises in Lee and Des Moines counties are made necessary by the high water level in subsoils, requiring construction of pumping stations.

The area east of a line drawn from Fort Madison in Lee County to

PROPOSED IOWA NATIONAL FOREST PURCHASE AREAS

Table 1033-A

(For counties which have been covered in  
the Forest and Wasteland Survey)

County	Total acres gross	Est. private land included	Total net acres for N. F.	County	Total acres gross	Est. private land included	Total net acres for N. F.
Adair	960	192	768	Johnson	30400	6080	24320
Adams	3200	640	2560	Jones	28480	5696	22784
Allamakee	107520	21504	86016	Kossuth	10560	2112	8448
Appanoose	37440	13488	77952	Lee	69600	13920	55680
Audubon	2160	832	3328	Linn	39840	7968	31872
Benton	21120	4224	16836	Louisa	44160	8832	35328
Black Hawk	16000	3200	12800	Lucas	58880	11776	47104
Boone	52440	10488	41952	Madison	29020	5804	23936
Buchanan	14560	2912	11648	Mahaska	16160	3232	12928
Cedar	19260	3872	15488	Marion	17600	3520	14080
Clarke	63360	12672	50688	Marshall	9120	1824	7296
Clay	5600	1120	4480	Mills	36320	7264	29056
Clayton	111040	22208	88832	Mitchell	6400	1280	5120
Clinton	19840	3968	15872	Monona	70500	14100	56400
Crawford	4680	936	3704	Monroe	91520	18304	73216
Dallas	39680	7936	31744	Montgomery	2720	544	2176
Davis	132480	26496	105984	Muscatine	35680	7136	28544
Decatur	149760	29952	119808	Page	4600	920	3680
Delaware	21760	4352	17408	Palo Alto	840	168	512
Des Moines	5312	1063	4249	Plymouth	25920	5184	20736
Dickinson	9936	1987	7949	Polk	22400	4480	17920
Dubuque	38080	7616	30464	Pottawattamie	76800	15360	61440
Emmet	6880	1376	5504	Poweshiek	18880	3776	15104
Fayette	17920	3584	14336	Ringgold	21600	4320	17280
Floyd	4160	832	3328	Scott	11808	2362	9446
Frederick	39200	7840	31360	Shelby	7520	1504	6016
Greene	21600	4320	17280	Tama	17580	3456	13924
Guthrie	26980	5396	21024	Taylor	1440	288	1152
Hardin	11040	2208	8832	Union	43200	8640	34560
Harrison	56320	11264	45056	Van Buren	77120	15424	61696
Henry	34720	6944	27776	Vernon	36800	7360	29440
Howard	7850	1570	6280	Warren	63520	12704	50816
Humboldt	2720	544	2176	Washington	28800	5760	23040
Iowa	13140	2628	10512	Wayne	18240	3648	14592
Jackson	12760	2552	10208	Webster	52000	10400	41600
Jasper	5760	1152	4608	Winnebago	56640	11328	45312
Jefferson	1352	270	1082	Woodbury	12320	2464	9856
				Total	2409378	480537	1928841

Counties not included in the above tabulation contain no considerable amount of forested lands. Attention is called to Figure 1033-1 which shows the total recommended areas for acquisition as public forest lands.



Spring Grove in Des Moines County was originally in cultivated land having a large number of drainage enterprises. This area is practically all under water at the present time.

Drainage enterprise costs for five counties in the Eastern Meat Area are as follows: Poweshiek, \$29; Iowa, \$20; Washington, \$21; Louisa, \$18; and Muscatine, \$15. The average investment per acre in this area is \$18.58, which is above the state average of \$12.62. There are pumping stations in Louisa County.

In the Eastern Dairy Area there are nine counties that have a high capital investment. Winnebago and Mitchell each have \$22 per acre; Worth has \$18; Cerro Gordo, \$20; Floyd and Bremer each, \$19; and Black Hawk, \$26. Allamakee County has a total capital investment of \$23 per acre. This county has a great deal of its capital invested in pumps.

#### Class 4.

Areas that come under this classification are recommended for a change in the cropping system for the checking of serious soil erosion, but not for changes in the size of holdings.

Since only a change in the cropping system is recommended and since these areas have already been largely covered, much of the analysis which has been made of incomes, tax delinquencies, migrations, etc. has been omitted from this section.

Problem areas in this class are confined to three of the five income districts: the Western Meat Area, Southern Pasture Area, and Eastern Meat Area.

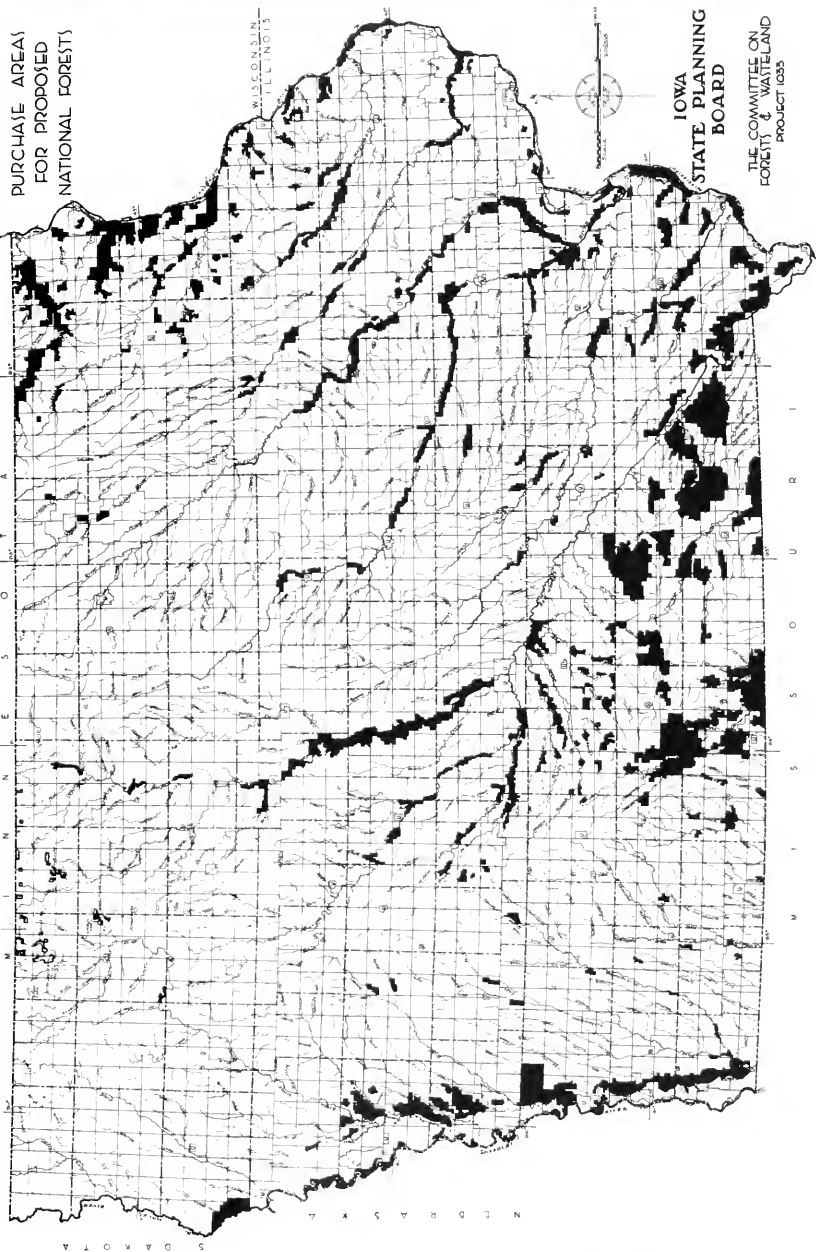
PROPOSED NATIONAL FOREST PURCHASE AREAS

Fig. 1033-1

This map shows the exact location of areas in the state which should be considered for purchase by either federal or state agencies.

# IOWA STATE PLAN

# FOREST PURCHASE AREAS



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PROJECT 1033

1033-1



Western Meat Producing Area

Class Problem 4 covers 14 counties in this section with the exception of 22 townships (two in Plymouth, three in Monona, six in Harrison, seven in Pottawattamie, one in Fremont and three in Mills). This problem occurs in each county of the Western Meat Producing Area with the exception of Lyon, Sioux, Cherokee, Sac and Carroll counties.

Southern Pasture Area

Class Problem 4 covers all or part of 20 counties in the Southern Pasture Area. This problem predominates in only four townships of Decatur County, eight in Lee, and six in Dallas County, but it occurs in each township of six counties and in well over half the townships in the remaining 10 counties. Figure 1030-3 shows the specific areas covered by each class problem.

Eastern Meat Producing Area

Class Problem 4 occurs in only six counties of the Eastern Meat Production Area: Jones, Johnson, Iowa, Louisa, Keokuk and Washington.

RECOMMENDATIONS

Western Meat Producing Area

Any system of soil management should take into consideration the following points in the definite order as outlined by the Soils Department, Iowa State College.

PROPOSED FOREST ACREAGE

Data Taken from Field Surveys

Fig. 1033-2

This map shows in a diagrammatic form the per cent of forests and wastelands in that part of the state which has been surveyed. The survey included the measuring, mapping, and segregation on data sheets of the following areas: (a) timber, (b) woodlands and pasture lands, (c) badly eroded lands, (d) lakes and ponds, (e) marsh lands, (f) overflowed lands, (g) grass lands, (h) heavy brush lands, (j) scattered brush lands, (k) other waste lands and formerly timbered lands that have been cut in the past three years.

# IOWA STATE PLAN PROPOSED FOREST ACREAGE

DATA TAKEN FROM  
FIELD SURVEYS

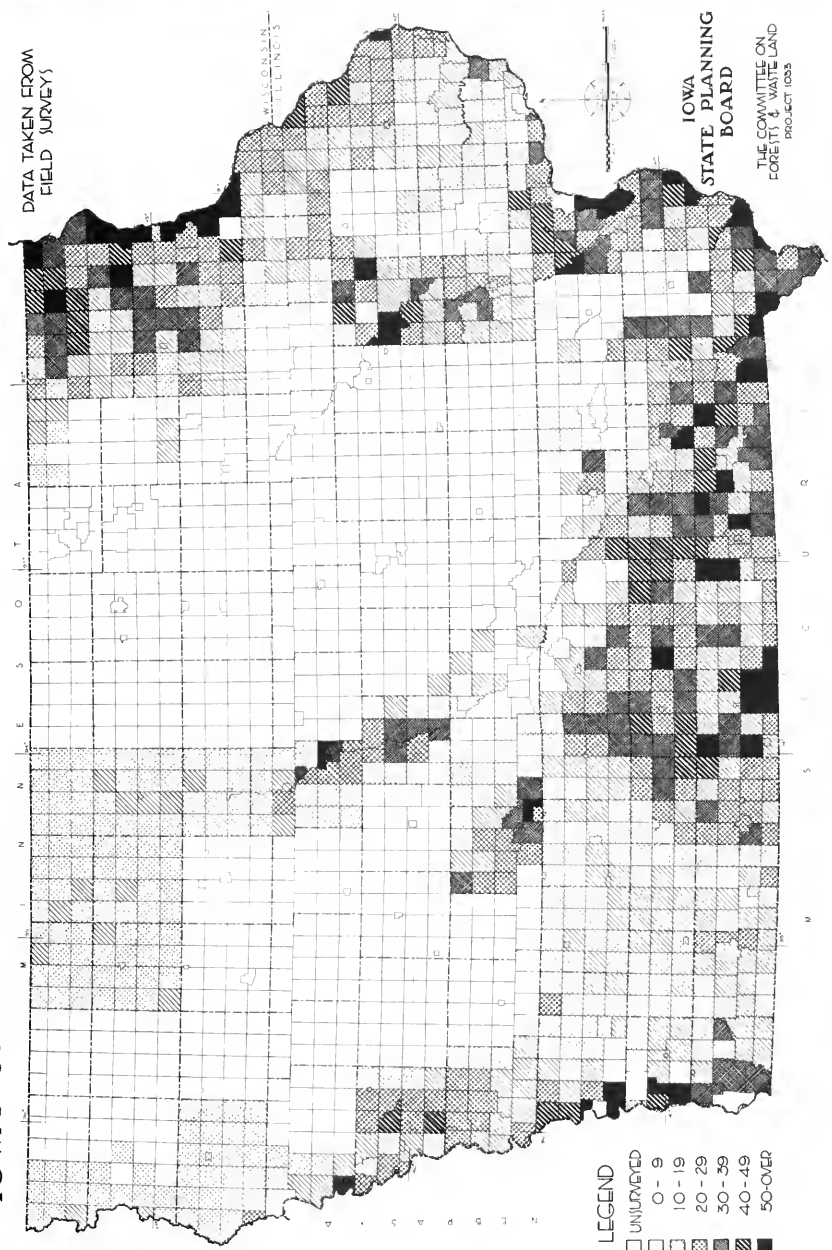
S DAKOTA

WISCONSIN  
ILLINOIS

- LEGEND
- UNIMPROVED
  - 0 - 9
  - 10 - 19
  - 20 - 29
  - 30 - 39
  - 40 - 49
  - 50-OVER

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FORESTS & WASTE LAND  
PROJECT 1035

1033-2







Iowa System of Soil Management

1. Drainage, cultivation, and erosion control.
2. Liming (ground limestone for acid soils).
3. Crop rotation (must include a legume).
4. Humus (livestock manure, green manure, corn stalks, oats, straw, etc.).
5. Fertilizer (superphosphate, rock phosphate, complete fertilizer).

The results of this system, which has been carried out on individual soil types in various parts of the state, have made it possible to obtain greater crop yields per acre and to keep the land permanently productive. The Iowa system of Soil Management is adaptable to all soils in the state.

It is becoming apparent that some method of soil management is necessary on all Iowa soils. Many of them are depleted in fertility and low in productivity. There is ample evidence of soil depletion in Iowa at the present time, in the abandoned farms, in the steadily increasing amount of crop land lying idle, in the eroded and gullied areas of many farms - areas which are constantly increasing - and in the decreasing of general farm crop yields which has occurred in spite of better farming methods, better varieties of grains and other improvements in farming techniques.

Regardless of the price situation, poor land - because of the greater cost of production under conditions of low fertility - will not produce crops profitably. Obviously it is difficult to farm land profitably when operating costs are high. With prices low, it becomes even more difficult. The costs of operation mount rapidly under a condition of low fertility.

PER CENT FORESTS AND WASTELANDS

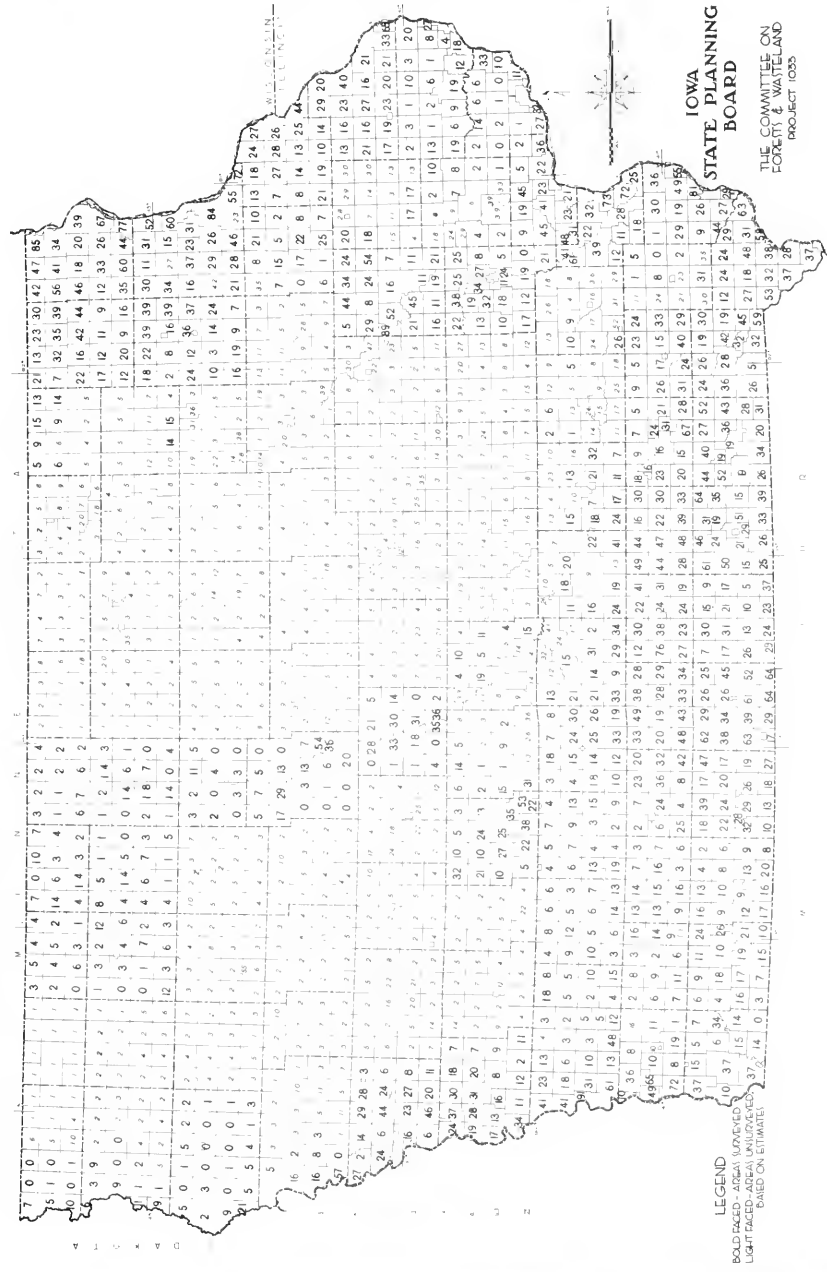
Fig. 1033-3

This map shows numerically, and by bold faced numbers, the actual percentage of all forests and wastelands that have been surveyed to date. These numbers have been the basis for the preparation of map number 1033-2.

This map also shows numerically and in light-faced small numerals the estimated amount of forests and wastelands in the unsurveyed areas of the state. This survey is now being completed. This estimate was made not for the purpose of anticipating the results of the survey, but at the special request of the Forestry Department U.S.D.A., Washington, D.C.

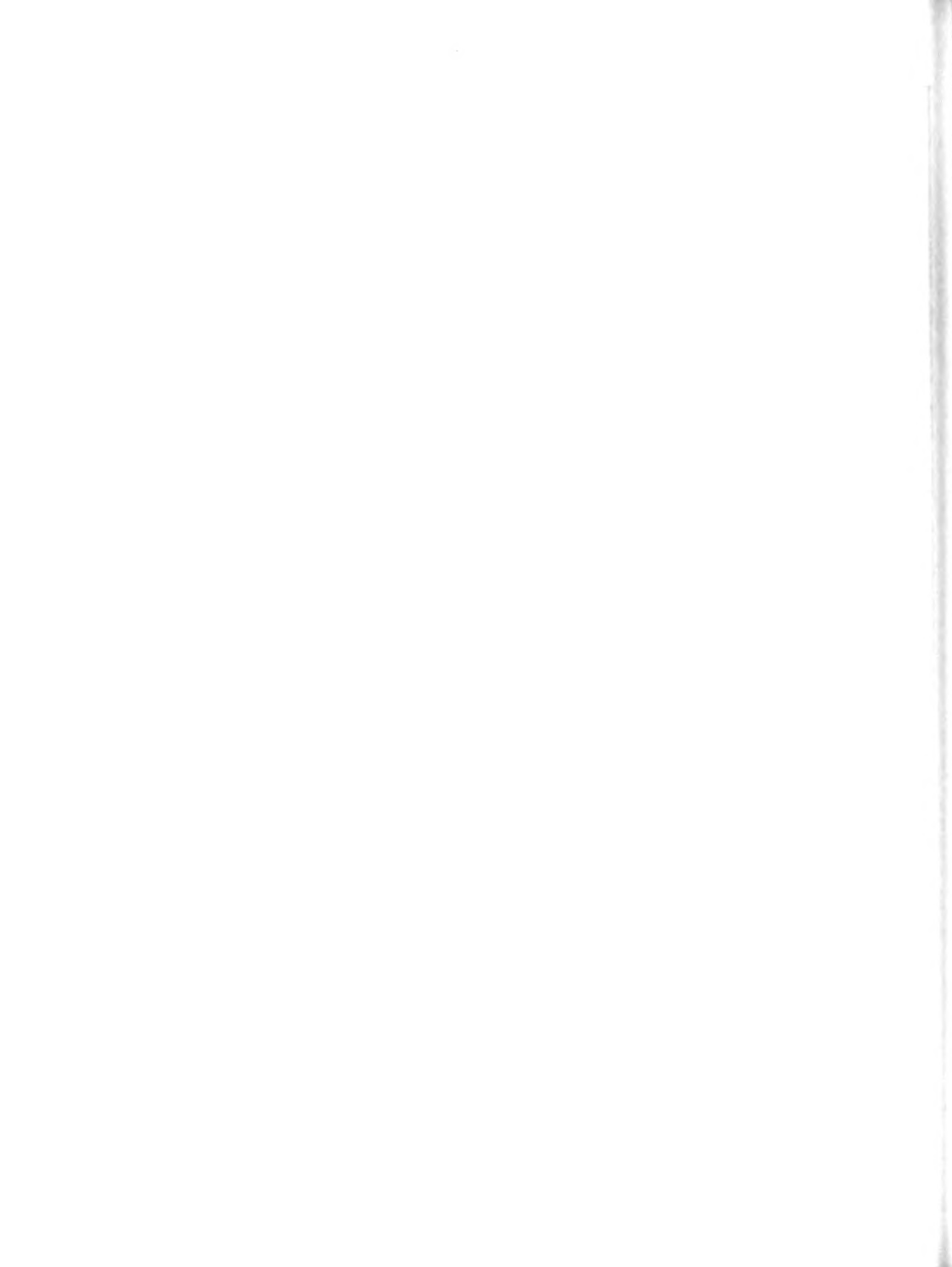
# IOWA STATE PLAN

## % FOREST & WASTE LANDS



LEGEND  
 BOLD FACED  
 LIGHT FACED  
 BASED ON ESTIMATES

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 FOREST & WASTE LANDS  
 PROJECT 1033



The importance of drainage is well recognized, as it is a basic requirement for productivity. Figure 1030-25 shows the investment per acre in drainage enterprise.

Proper cultivation of the land often proves to be very effective in improving the productivity of the soil. The time and depth of plowing are both important, as is the cultivation of crops.

The prevention and control of erosion is the most important treatment needed on many soils in this area. On such soils no other treatment alone will prove of any value. Some lands, of course, erode much more readily than others, and there is a distinct relation to soil type. The Marshall silt loam in this area has been subjected to severe sheet erosion under methods of mismanagement. Strip farming on this soil type would be a most effective way of helping to control erosion. Any land which is apt to be gullied or to undergo surface washing must be protected from such injury.

Approximately 80 per cent of the land in this section is acid, needing as much as one and one-half tons of lime per acre. Legumes are necessary in crop rotation, and liming must be practiced if legumes are to be grown most satisfactorily. Refer to Figure 1030-26 for the relative acidity in various sections of the state.

The value of crop rotation is well-known. Continuous growing of any one crop is not conducive to satisfactory results. Any good rotation should include a legume to aid in the maintenance of soil fertility.

PROPOSED FOREST ACQUISITIONS

Allamakee County

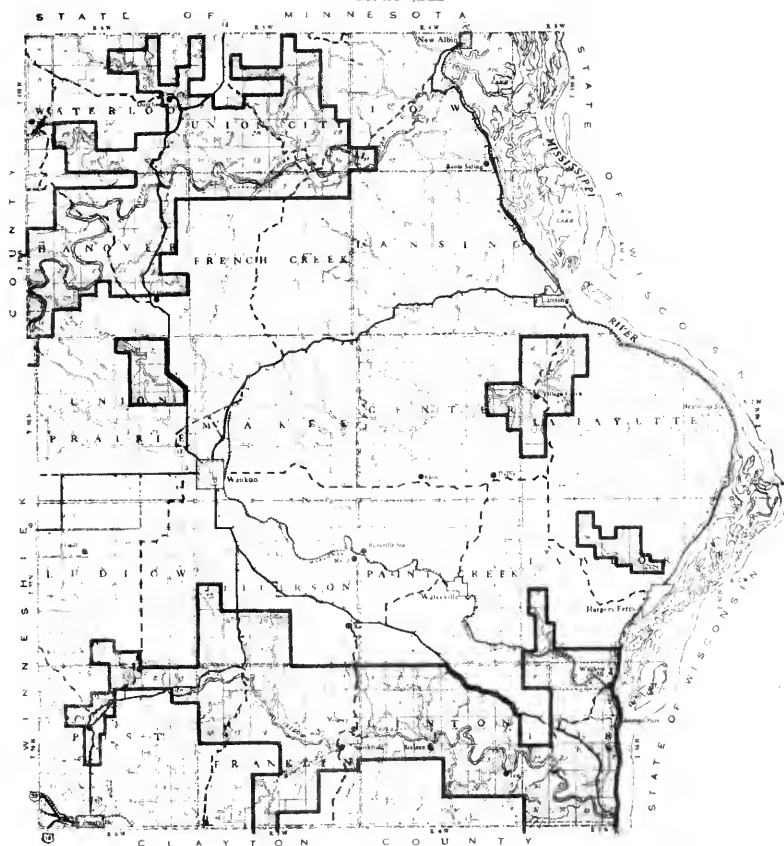
Fig. 1033-7

This map shows the exact location of areas recommended for government acquisition and subsequent utilization for permanent pasturage and forests.

IOWA STATE PLANNING BOARD  
PROPOSED  
FOREST ACQUISITIONS  
ALLAMAKEE COUNTY, IOWA

PREPARED BY  
THE COMMITTEE ON  
FORESTS & WASTELAND  
PROJECT 1033

GRAPHIC SCALE  
0 1 2 3 4 5 6 7 8 9 10 MILES



1033-7





Figure 1030-21 shows recommended crop acreage changes by districts. It is recommended that the corn acreage of this section be reduced by 613,657 acres or 28.6 per cent of the 1929 acreage, and that the small grain acreage be reduced 3.4 per cent or 35,174 acres. Acreages recommended for increase are as follows: total pasture, 8.7 per cent (111,910 acres); total tame hay, 203.6 per cent (760,670 acres) or total hay and pasture acreage is to be increased 52.7 per cent. The reduction of corn and small grain acreages and the increase in hay and pasture acreages will be of much benefit in checking and preventing erosion.

The regular addition of organic matter to the land is absolutely necessary for continued fertility. Farm manure and green manure are of large value on all soils and their application brings about large crop increases in practically all cases.

All soils in Iowa are low in phosphorus. The use of phosphate and other fertilizers will be of large value on many types. Tests have shown that rock phosphate or superphosphate may be applied profitably to many Iowa soils. Sometimes one material and sometimes the other proves superior, depending upon the particular conditions of the test. Occasionally a complete commercial fertilizer may have excellent effect. It is urged by the Soils Department that farmers test such fertilizer on small areas before they make an extensive application.

#### Southern Pasture Area

Approximately 95 per cent of this area is acid, needing from two to

PROPOSED FOREST ACQUISITION

Davis County

Fig. 1033-8

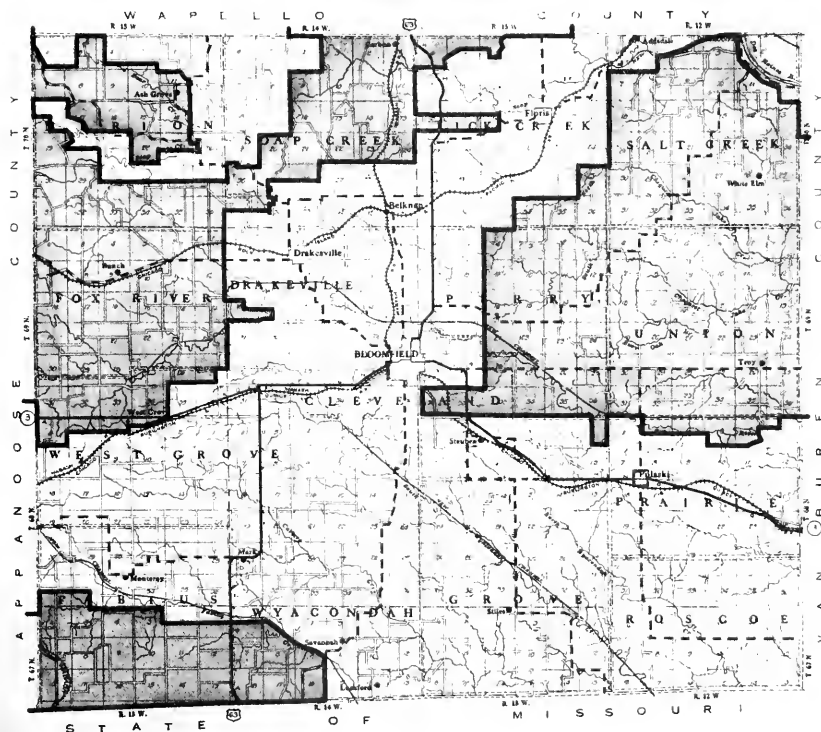
This map gives the location of areas recommended for retirement from cultivation and conversion to permanent pasture and forest uses.

IOWA STATE PLANNING BOARD

# PROPOSED FOREST ACQUISITIONS DAVIS COUNTY, IOWA

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PROJECT 1033

2 0 2 MILES  
GRAPHIC SCALE



1033~8



more than four tons of lime per acre. Refer to Figure 1030-26.

In this district the Soils Department largely recommends a three-year rotation of corn, oats and clover. Especially on the rolling land which is subject to erosion, care should be taken not to have two cultivated crops in successive years. The increased use of sweet clover as a green manure on the less erosive soils is highly recommended because of its deep root system and heavy top growth.

The Soils and Farm Crops departments of Iowa State College recommend the following changes in crop acreages in the Southern Pasture Area:

---

	Per cent Change	Net Change in Acreage
Corn	- 23.8	- 388,322
Small Grain	+ 11.5	+ 99,710
Total Pasture	+ 4.6	+ 111,001
Total tame hay	+ 46.3	+ 335,820
Total Hay & Pasture	+ 14.3	+ 446,821

---

These changes in crop acreages will aid in checking and preventing further soil erosion. The small gullies in the more level areas may be checked by "plowing in". In the more rolling areas, however, it is best to supplement the "plowing in" with a series of "staked in" dams or earth dams. Large gullies may be generally controlled by the same methods as for smaller gullies.

PROPOSED GOVERNMENT ACQUISITION  
Van Buren County

Fig. 1033-9

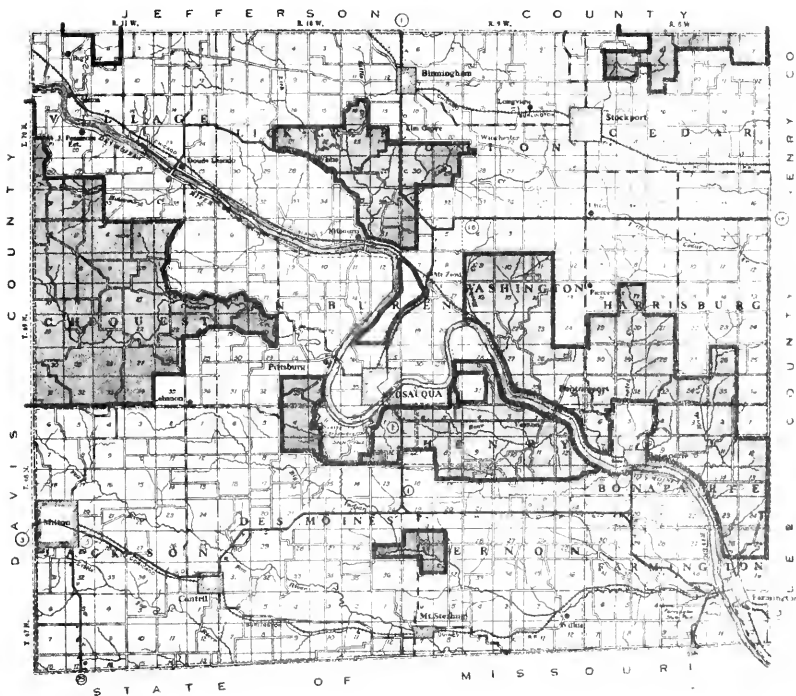
This map shows areas recommended for purchase and development as public forests. Much of this land is now sub-marginal in character and should be reforested to prevent erosion and further depletion of the soil. Productive agricultural lands within these areas might be reserved for grazing purposes under public control. Considerable employment would be provided in the forests, and in minor forest product industries.

IOWA STATE PLANNING BOARD

PROPOSED  
FOREST ACQUISITIONS  
VAN BUREN COUNTY, IOWA

PREPARED BY  
THE COMMITTEE ON  
FORESTS & WASTELAND  
PROJECT 1033

2 1 0 1 2 MILES  
GRAPHIC SCALE







They may also be effectively controlled through the planting of black locust on the sides of the gully bank and willows and cottonwoods in the bottom or wet part of the gully.

Eastern Meat Producing Area

From 90 to 95 per cent of this area is acid, needing from two to four or more tons of lime per acre. Jones County needs an average of two to three and one-half tons per acre, whereas, the other five counties (Iowa, Johnson, Keokuk, Washington and Louisa) need a minimum of four tons per acre.

The acreage changes in the following table were recommended by the Farm Crops and Soils sections of Iowa State College.

RECOMMENDED CROP ACREAGE CHANGES FOR CLASS  
PROBLEM AREA 4 IN THE EASTERN MEAT PRODUCING AREA

	Per cent Change	Net Change in Acreage
Corn	- 26.9	- 152,862
Small Grain	- 19.9	- 57,941
Total Pasture	- 4.7	- 34,706
Total Tame Hay	- 38.9	- 97,269
Total Hay & Pasture	- 13.4	- 131,975

Suitable rotation plans adapted to these acreage changes, may be

## SOIL AREAS AND EROSION

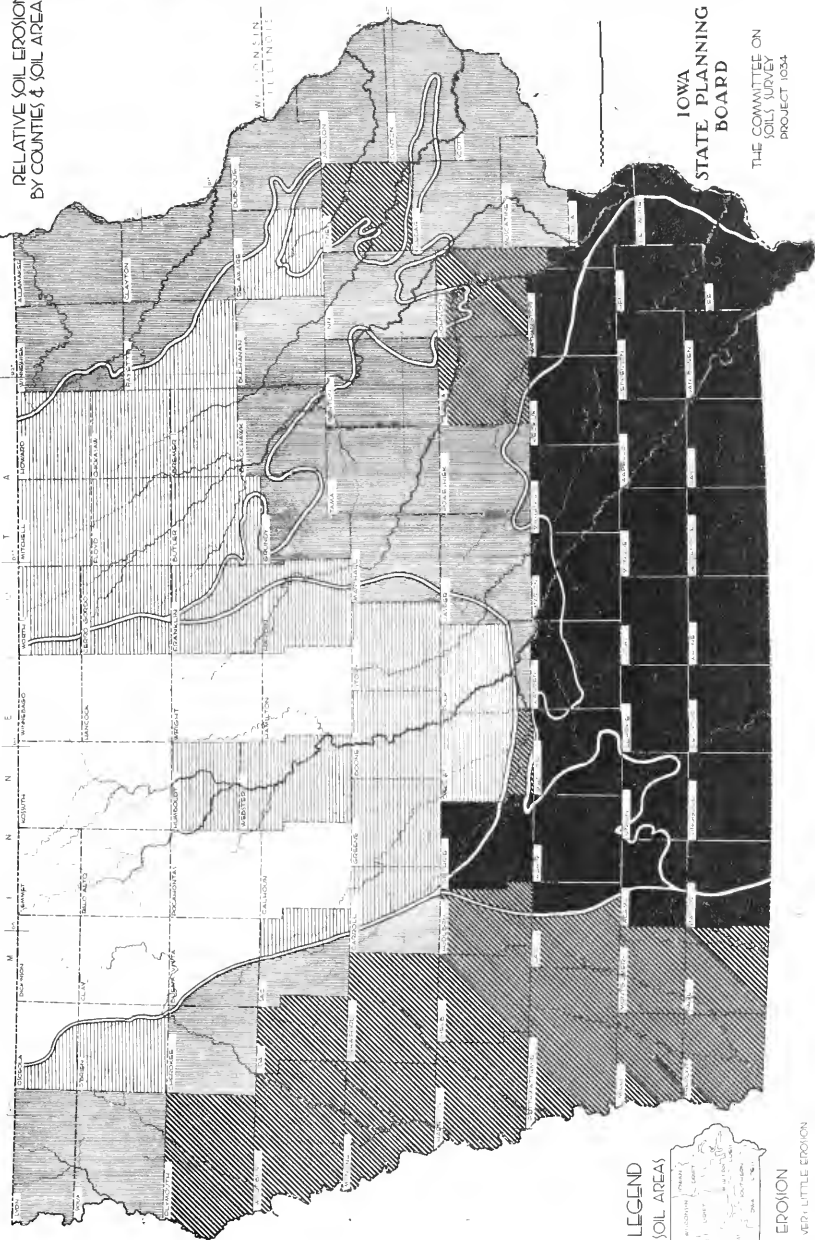
Fig. 1034-1

The extent and degree of erosion in the state by counties are shown. The counties in which erosion is a major factor, are located in the western and southern two tiers of counties. Erosion in the north central, or Cash Grain Area, is of minor importance due to the fact that the topography is level to undulating.

# IOWA STATE PLAN

# SOIL EROSION

RELATIVE SOIL EROSION  
BY COUNTIES & SOIL AREAS



## LEGEND



## EROSION

- VERY LITTLE EROSION
- SLIGHTLY ERODED
- CONSIDERABLY ERODED
- EXTENSIVELY ERODED
- VERY EXTENSIVELY ERODED

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SOIL EROSION  
PROJECT 1034

1034 - 1



obtained from the Farm Crops section of Iowa State College. For a comparison of recommended acreage changes in various sections of the state, refer to Figure 1030-27.

The above recommendations for liming and crop acreage changes are very important in controlling soil erosion, but it is desirable that their application be supplemented by the use of farm manure and green manure.

#### RECOMMENDATIONS

##### Proposed Plan to Finance the Buying of Limestone in Iowa

It is a well-known fact that any system of crop rotation should include provision for a legume. But it is useless to attempt a rotation including legumes until the soil is given any necessary correction for acidity. Many Iowa soils, especially in the Southern Pasture Area, are highly acid and therefore are not adapted to growing legumes. The problem is further complicated by the fact that many farmers are not financially able to buy limestone.

It is imperative that these farmers be provided with a means of obtaining the lime. It is desirable that they be enabled to purchase limestone and pay for it over a period of years. The high points of a plan proposed by the Soils Department of Iowa State College Extension Service are listed below.

1. Sanction of the County Board of Supervisors to float bonds should be secured.
2. A "limestone loan fund" from the proceeds of the bonds should be

SOIL EROSION AND SOIL AREAS

Fig. 1034-2

This map designates the soil areas and soil erosion in Iowa. There are five soil areas in Iowa. Three of these areas, namely, Missouri Loess, Southern Iowa Loess, and Mississippi Loess, are formed by vast accumulations of dust-like material which settled out of the air during an early period. These soils have a fine texture and are subject to erosion. The drift soils are heavier in texture and contain pebbles and stones.

# IOWA STATE PLAN

# EROSION BY SOIL AREAS

RELATIVE OCCURRENCE OF  
EROSION IN VARIOUS SOIL  
AREAS OF IOWA

## LEGEND

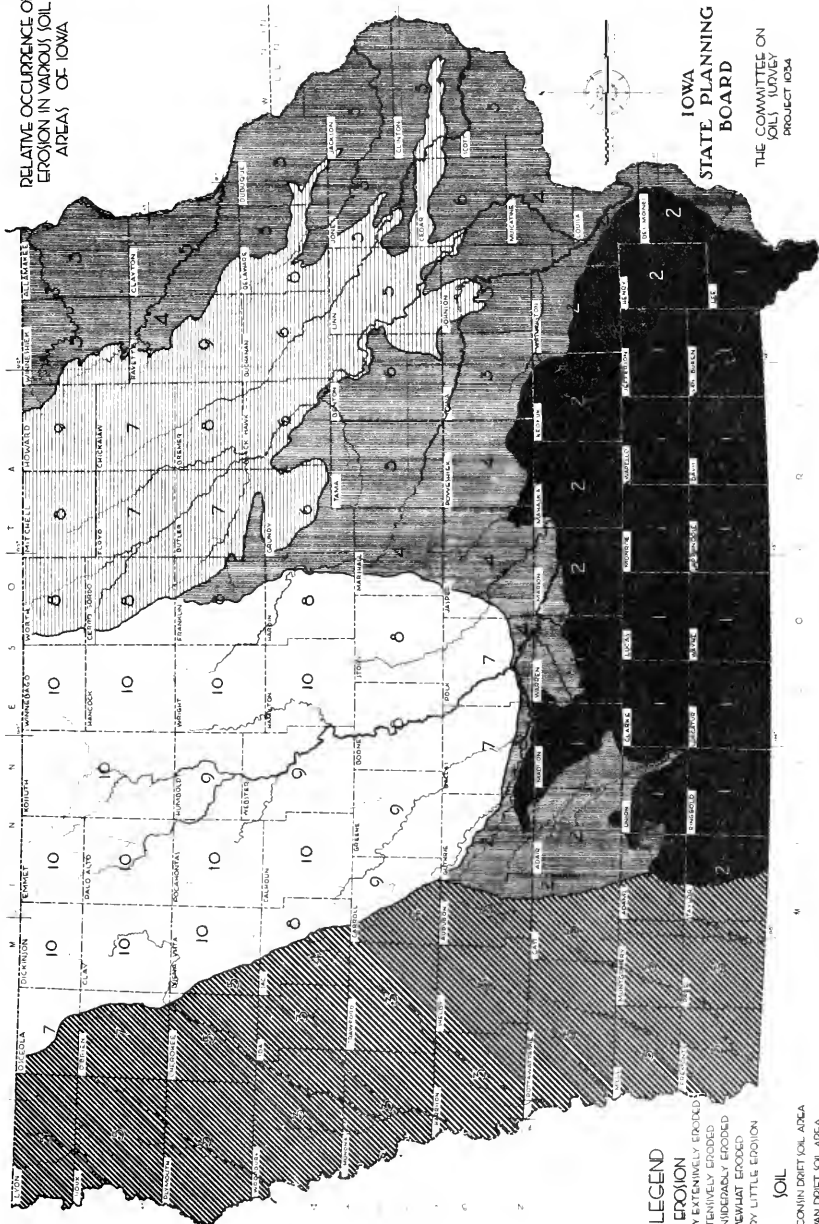
**EROSION**  
1-2 VERY EXTENSIVELY ERODED  
3-4 EXTENSIVELY ERODED  
5-6 MODERATELY ERODED  
7-9-9 CONSIDERABLY ERODED  
10 VERY LITTLE EROSION

**SOIL**  
WISCONSIN DIRT SOIL AREA  
IOWAN DIRT SOIL AREA  
MISSOURI LOESS SOIL AREA  
MISSOURI LOESS SOIL AREA  
SOUTHERN IOWA LOESS AREA

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PROJECT 1934

1034-2







established.

3. Each farmer needing limestone may obtain a loan from this fund, after furnishing proof that the money is to be used for the specified purpose and giving evidence that an accepted system of soil management will be followed, possibly under the direction of the County Agricultural Agent.
4. The loans should be repaid over a period of ten years at a reasonably low rate of interest. The farmer should have the privilege of repaying the loan any time before it is due.
5. The bonds may be retired serially as the loans are paid off.

#### OTHER CLASSES

Due to the fact that drainage and stream channel straightening has already been overdone in many sections of the state, the Iowa State College authorities who are acquainted with this phase of agriculture are unwilling to recommend areas of any substantial size for this consideration. Most all large areas in Iowa which could benefit by drainage construction have already received this improvement.

Areas of forest or cut-over land not in farms and not in public ownership, where a change in land use would be desirable, are non-existent in Iowa, except in possibly a limited number of very small units of a few acres each. Most forest and cut-over land in Iowa is in farms and is used in the general farm enterprise, while the small remainder is in parks and other forms of public ownership.

## RANGE LANDS

Range lands where conditions of land use result in depletion of forage, in erosion, and in economic instability are of an indeterminate amount in Iowa. An area in the southwest corner of Plymouth County, in Sioux and Hancock townships, probably comes as near to what is ordinarily thought of as range country as any area in the state.

Most of this area is extremely rough and cut with numerous small drainage-ways. The soil material of the steep surface has slipped, forming "catsteps" on the hillsides. Much of the land of this type is unsuited to cultivation and should be allowed to remain in pasture and woodland.

This soil is highly calcareous allowing only certain types of trees to be used in reforestation. The forestry field maps show this area as practically all cutover land having small patches of timber scattered throughout the two counties, mainly along the rivers and drainage-ways. The division between areas for reforestation and areas for grazing will have to be determined by actual survey.

Sioux township has slightly more than 60 per cent of the land in crops and the balance in pasture and wasteland. Hancock township has approximately 40 per cent in crops with the balance in pasture and wasteland.

Tax delinquency has steadily increased in both townships. Sioux township increased from 28 per cent in 1928 to 65 per cent in 1932. Hancock township increased from 15 per cent to 52 per cent during the

same period. See Figures 1031-1, 2, 3, 4 and 5.

This particular area is also recommended by the Forestry Department for reforestation and for an upland game preserve. See Figure 1033-1. A survey of this area will be necessary before a decision can be reached as to the exact method of handling.

#### LAND SUITABLE FOR CLOSER SETTLEMENT

The area designated on Figure 1030-4 as being capable of conveniently absorbing farm population removed from poor land lies in the cash grain area. This area is so termed largely due to the fact that in these counties from 25 to 60 per cent of the corn and oats produced is sold and shipped to other areas within and without the state. It appears from an economic standpoint that this area could well adopt a program of more intensive use of labor. If such a program were invoked the following tendencies would occur: Hog and cattle feeding would tend to increase, acreages of pasture and hay would increase, with a resulting decrease in corn and grain shipments from the area. Thus it appears that an increased number of people could be absorbed desirably.

The social and psychological implications of such a procedure have not been investigated and will in a large measure be unpredictable until such time as thorough and careful investigation and analysis are made.

A rather careful examination of the average production and size of farms by townships in this area, as indicated in Figures 1030-6, 7 and 8 reveals the possibilities of absorbing increasing numbers of people. The

feed production per acre for these counties ranges between 27 and 30. Together with the high feed unit production per acre in this cash grain area we also find a large average size of farms in most of the townships, as compared to those in other areas of the state. These farms range between 170 and 200 acres in size. A third criterion, feed unit production per farm, is - as might be anticipated - very high relative to that for other areas of the state. It was found upon examination of data that with almost no exception the townships in this area produce not less than 4000 feed units per farm and very frequently approach 6000. These figures offer a significant contrast to comparable averages in the townships of the southern counties of the state where small farms are accompanied by small feed unit production per acre resulting in the extremely low figure of 1000 to 2000 feed units produced per farm.

#### FISH AND GAME

##### Biological Survey Project 1035

This Biological Survey Project 1035 under the Iowa State Planning Board has had the following as its objectives:

##### Objectives

- A. A critical evaluation of all areas within the state which now have or might have waterfowl or upland game value.
- B. The determination of the improved use to which each of the various areas is best suited, regarding not alone its wild life values, but the adjusted and proper use of lands (or waters) and the coordinated

unification of such tracts into a balanced long-time recreational and rehabilitation program.

- C. The development of a plan of acquisition, improvement, and perpetuation for these units, which will embody the judicious expenditure of public monies.
- D. The education through demonstration and research of the feasibility of these readjusted uses of natural resources.

#### Accomplishments

The planned program of this Biological Survey embodied three more or less distinct types of surveys. These are as follows:

- A. The Survey of Salt Creek Township, Davis County. This is a demonstration of intensive game production on sub-marginal land.
- B. The Lake, Slough and River Survey. This was for the purpose of determining the waterfowl, fishing, and other recreational possibilities on these areas.
- C. The Reservoir, Small Pond, and Gravel Pit Survey. This important reconnaissance in the primary drouth area, coordinated with related projects, provides a plan of judicious corrective measures, and recommended uses.

#### SALT CREEK PROJECT

A preliminary portfolio of charts on Davis County was prepared at Ames for Mr. J. N. Darling and Dr. W. C. Boone of the Fish and Game Commission, through the cooperation of the E.C.W., in the spring of 1934. The detailed

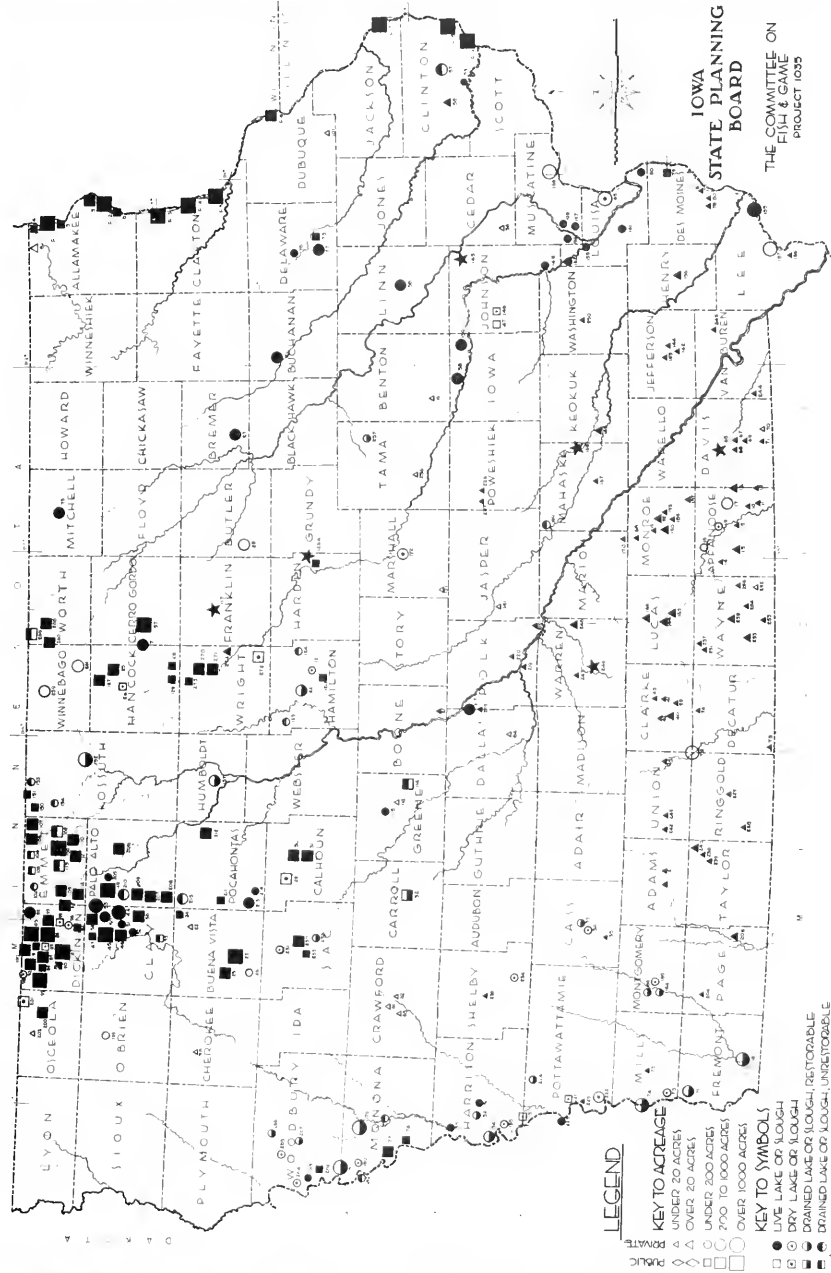
CLASSIFICATION OF IOWA WATERS

Fig. 1035-1

The natural lake region of Iowa is confined principally to the northwestern part of the state. Southern Iowa is dependent upon its numerous rivers, reservoirs and the newly created artificial lakes for recreational centers. This classification indicates the condition of these present or former bodies of water, with an evaluation as to the restorability of certain drained lakes.

# IOWA STATE PLAN

# CLASSIFICATION OF WATERS



## LEGEND

KEY TO ACRAGE

- UNDER 20 ACRES
- △ OVER 20 ACRES
- UNDER 200 ACRES
- △ OVER 200 ACRES
- 200 TO 1000 ACRES
- △ OVER 1000 ACRES

## KEY TO SYMBOLS

- LIVE LAKE OR POND
- △ DRAINED LAKE OR POND
- DRAINED LAKE OR POND RESTORABLE
- △ ARTIFICIAL LAKE UNDER CONSTRUCTION
- LIVE RESERVOIR OR POND
- △ DRY RESERVOIR OR POND
- NOTE: OTHER SYMBOLS NOT INVESTIGATED

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FISH & GAME  
PROJECT 1035

1035-1





survey in Salt Creek township, northeastern Davis County, was started in May and carried through to completion by the Iowa State Planning Board.

The repeatable demonstration of intensive game production on a 5,000 acre tract, proposed for Federal acquisition and development, is a unique use of and improved use for poor agricultural land.

When the land has been acquired through the Land Acquisition Division, A.A.A., a Game Management Corporation will be organized, the controlling authority of which will be vested in the Iowa Fish and Game Commission. The Corporation Manager will supervise the development, planting, cropping, and patrolling of the tract. Six selected families, to be housed in the six best Federally-owned homes, located in strategic parts of the area, will be employed in the operation of the industry. One-half of their compensation will be derived from per diem labor and the remainder from cropping game feed-patches on a share basis.

The results of this survey indicate that intensive game production may be a financially sound industry for the readjusted use of eroded and submarginal agricultural lands. The expected returns from game and forest products will, at the end of five years, balance the game and forest operation costs. Within twelve years the returns will be sufficient to have refunded the operation costs of the first five years, which will have been provided for through an endowment fund from a Federal agency.

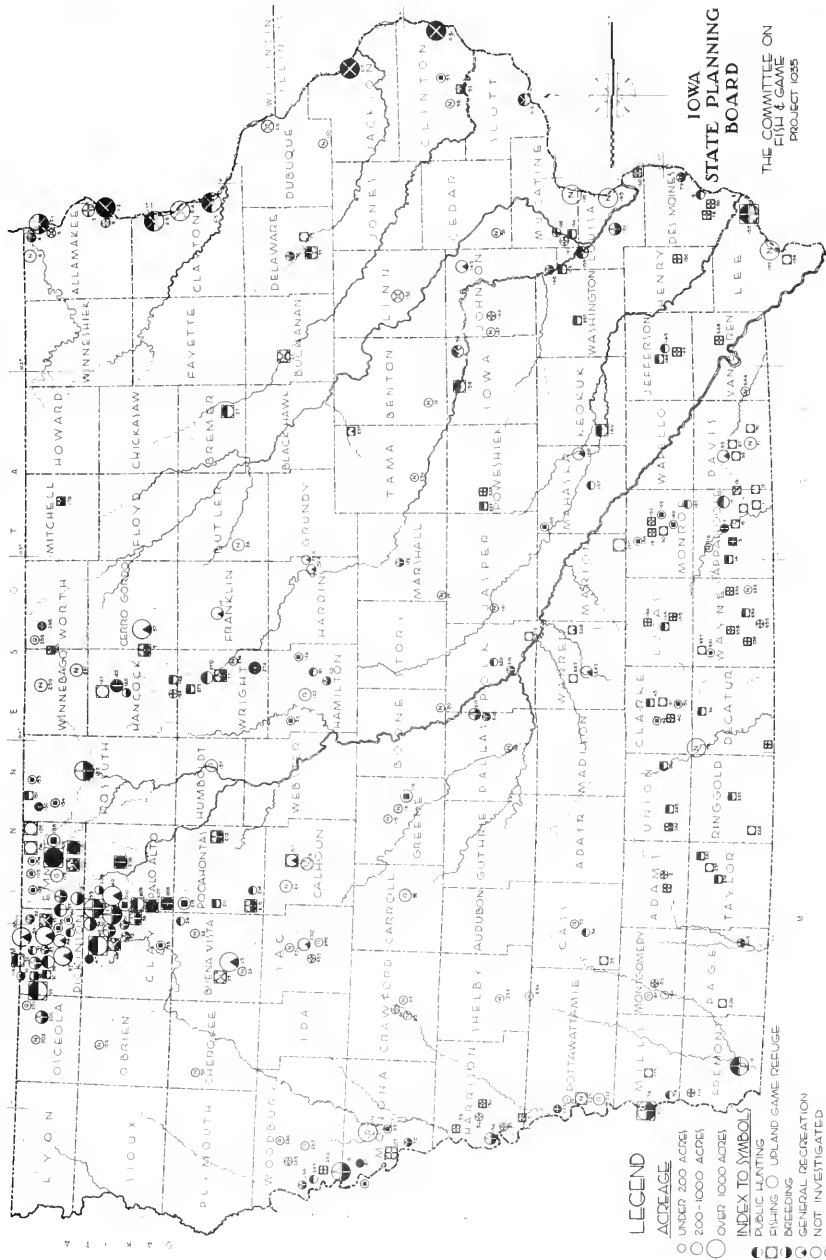
On August 30 the completed report on the Salt Creek Project was unanimously accepted by the Iowa State Planning Board. Copies have been presented for Federal consideration.

PROPOSED USES OF IOWA WATERS

Fig. 1035-2

The planned program of uses for Iowa Waters embodies the judicious development of fishing areas, waterfowl refuges, and breeding grounds, public shooting grounds, and general recreational areas.

# IOWA STATE PLAN PROPOSED USE OF WATERS



## LEGEND

### ACREAGE

- UNDER 200 ACRES
- 200-1000 ACRES
- OVER 1000 ACRES

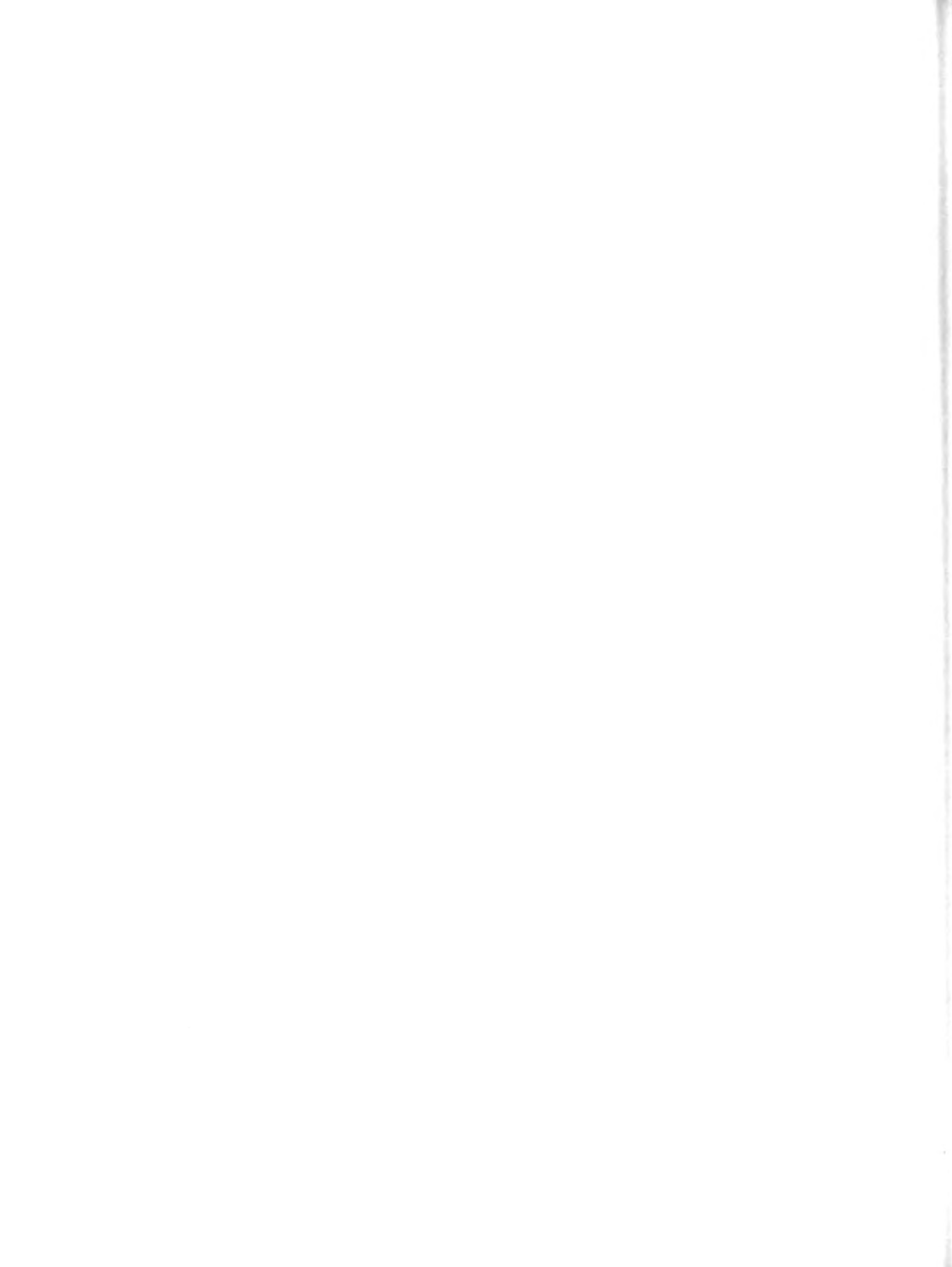
### INDEX TO SYMBOLS

- PUBLIC PLANTING
- BREEDING
- GENERAL RECREATION
- NOT INVESTIGATED
- FISHING
- RECREATIONAL FISHING OR RECREATIONAL VALUE
- EXISTING REFUGE
- PROPOSED REFUGE
- PROPOSED RESTORATION
- UPLAND GAME REFUGE

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PROJECT 1035

1035-2



### THE LAKE, SLOUGH, AND RIVER SURVEY

This survey was inaugurated to evaluate and classify all of the meandered lakes in Iowa. In addition, the survey was extended to include all other privately owned waters. The preliminary report on the classification of these waters or former bodies of water is summarized in the following table. This includes the location, size of the area, extent of the water surface, fishing reputation, and recommended waterfowl uses. The location and present classification of each unit has been shown on Figure No. 1035-1.

Because of the meagre number of Iowa lakes, it has been generally recognized, and this survey has accentuated the fact, that a balanced and well rounded program must be inaugurated for their expeditious use. Therefore, a definite effort has been made throughout this survey to differentiate between lakes whose primary use is for general recreation, those which are primarily fishing lakes, those whose greatest benefit will be in producing and preserving wild life, and that group of waters which are only for power or municipal water supplies. The results of this evaluation, while reasonably complete, may be subject to modification with the completion of this survey.

Figure No. 1035-2 is designed to present the recommended long-time program of development. The broader and improved usefulness on fully half of the recommended areas will be achieved through this program. Recommendations on lands for public access, breeding areas for waterfowl, refuges, and public shooting grounds have been prepared for consideration

TABLE OF CLASSIFICATION

The following table enumerates the legend as used in the succeeding summarized Classification and Proposed Uses of Iowa Waters.

- I-1 Public live lake or slough
- I-2 Public dry lake or slough
- I-3 Public drained lake or slough, restorable
- I-4 Public drained lake or slough, not restorable
- I-5 Public artificial lake proposed or built
- I-6 Public reservoir or pond, containing water
- I-7 Public reservoir or pond, dry or drained
  
- II-1 Private live lake or slough
- II-2 Private dry lake or slough
- II-3 Private drained lake or slough, restorable
- II-4 Private drained lake or slough, not restorable
- II-5 Private artificial lake proposed or built
- II-6 Private reservoir or pond, containing water
- II-7 Private reservoir or pond, dry or drained

CLASSIFICATION AND PROPOSED USES OF IOWA WATERS

Project Number	County	Name	Class	Size		Fish	Waterfowl Evaluation Breeding, Refuge, or Public Shooting	Fishing Open to Public
				Total Area	Marsh or Water			
1	Adams	Corning Res.	II-6	40	15	Yes	Refuge	Yes
2	"	Corning Refuge	II-3	15		No	Refuge	No
3	Allamakee	Big Lake No. 1, Lansing	I-1	679	259	Yes	Refuge	Yes
4	"	Big Lake No. 2	II-1	200	-	Yes	Status to be determined	Yes
5	"	Kain's Lake	I-1	-	-	Yes	with the U.S. Biological Survey	Yes
6	"	Mad Hen or Gun Lake	I-1	164	-	-		
7	"	Langlie Pond, Dorchester	II-6	To be investigated				
8	"	Perjue Lake	II-2	120	Dry	No	Refuge	No
9	Appanoose	C.B. & G., Pond, Moulton	II-6	5	5	Yes		No
10	"	Little Pond, Moulton	II-6	20	15	Yes		Yes
11	"	New Pond, Moulton	II-6	10	2	Yes		Yes
12	"	2 City Res., Centerville	II-6	43	53	Yes	Refuge	Yes
13	"	Mystic Pond	II-6	15	10	Yes	Public Shooting	No
14	"	Rod & Reel Pond, Centerville	II-6					
15	"	City Res., Moulton	II-6	5	3	Yes	Refuge	No
16	"	Chariton Bottoms	II-1?	39	21	Yes	Public Shooting	Yes
17	"	Long Slough	II-4?	"	"			
18	"	Keystone Res.	II-6?	"	"			
19	Benton	Medrid Res.	II-6?	"	"			
20	Boone	Buchanan County Refuge	II-1	Wapsipicon River			Breeding, Refuge and Public Shooting	
21	"	Buena Vista Marathon Pite	II-6?	To be investigated				
22	"	" Storm Lake	I-1	3,080	3,080	Yes	Resting	Yes
23	"	" Pickarel Lake	I-1	176	171	Yes	Public Shooting	Yes
24	"	" Little Storm Lake	I-1	280	100	No	Refuge	
25	"	" Toohy's Slough	II-2	To be investigated				
26	"	Upper Wapsipicon,						
27	Brewer	Dayton	II-1	Wapsipicon River			Public Shooting	
28	Butler	Considine Lake	II-1	To be investigated				
29	Calhoun	Towhead Lake	I-2	"	"			
30	"	North Twin Lake	I-1	569	509	Yes		

Project Number	County	Name	Class	Size Total Marsh Area or Water	Fish	Waterfowl Evaluation Breeding, Refuge or Public Shooting	Fishing Open to Public
31	Calhoun	South Twin Lake	I-1	800	596 No		
32	Carroll	Swen Lake	I-3	Proposed restoration	"		
33	Cass	Lewis Marsh	II-2	120	Dry No	Shooting	
34	"	Lamb's Lake	II-2	15	4 Yes		
35	"	Griswold Ballast Pits	II-6	To be investigated			Yes
36	Cedar	Here's Run, West Branch	II-6	3,643	Yes	Resting	No
37	Cerro Gordo	Clear Lake	I-1	836	350 Yes	Nesting, Refuge	
7	"	Venture Marsh	II-1	To be investigated			
38	Cherokee	Gund's Sand Pit, Marcus	II-6	40	2	Refuge	Yes
39	Clerke	Beacon's Pond, Osceola	II-6	150	30 Yes		Yes
40	"	New Osceola Res.	II-6	125	10 Yes		Yes
41	"	C.E. & C., Osceola	II-6	9	Dry No		Yes
42	"	Ballast Pits, Warwick	II-7	80	5 Yes	Public Shooting	Yes
43	"	Osceola City Res.	II-6	1,430	500 No	Breeding, Refuge	No
44	Clay	Barringer Slough	II-1	1,190	1,190 Yes	Resting	Yes
45	"	Trumbull Lake	I-1	450	450 Yes	Breeding, Refuge	No
46	"	Round Lake	I-1	285	100	Breeding, Shooting	No
47	"	Den Green's Slough	I-1	(Buena Vista County)			Yes
48	"	Pickrel Lake	I-1	1,280	1,076 Yes	Resting	
49	"	Lost Island Lake	II-1	410	100 No	Breeding, Refuge	
50	"	Smith's Slough	II-1	193	50 No	Breeding, Refuge	
51	"	Whitford Slough	II-1	681	25 No	Breeding, Refuge	
52	"	Rosacker Slough	II-1	1,702	300 Yes	Breeding, Refuge	
53	"	Mud Lake, Rutledge	II-1	195	Drained		
54	"	Dewey's Pasture	I-4	454	261 Yes	Breeding, Refuge	Yes
55	"	Mud Lake, Webb	I-1	Drained			
56	"	Elk Lake	II-4	To be investigated			
57	Clinton	Goose Lake	II-67	Wapsipinicon River		Breeding	
58	"	Springs Brook, Dewitt	II-1	To be investigated			
59	"	Dewitt Gun Club	II-6	To be investigated			
60	Crawford	Leithner's Pond, Denison	II-6	To be investigated			
61	"	Horseshoe Lake, Denison	II-6	"	" Yes		
62	"	Sand Pit, Denison	II-6	"	"		
63	"	Swallow Pond	II-77	"	"	Refuge	Yes
64	Dallas	Swallow Pond	I-5	Under construction			
65	Davis	Lake Wapello	I-5				



Project Number	County	Name	Class	Total Area	Size Marsh or Water	Fish	Waterfowl, Breeding, Refuge, or Public Shooting	Fishing Open to Public
67	Davis	Rock Island Res., Drakesville	II-6	25	3	Yes	Yes	Yes
68	"	Round Lake, Drakesville	II-6	1/2	1/2	Yes	Yes	Yes
70	"	Bloomfield City Res.	II-6	1	1	Yes	Yes	Yes
71	"	Bloomfield County Farm	II-6	To be investigated				
72	Decatur	Grand River Bottoms	II-1?	"	"			
73	"	Home Pond, Lemoni	II-6	26	5	Yes	Refuge	Yes
74	"	C.B. & Q. Res., Van Wert	II-6	7 1/2	4	Yes	Public Shooting	Yes
75	Delaware	Silver Lake	I-1	45	1	Yes		
76	"	Smith's Slough	II-1	480	Dry No		Refuge	
77	"	Hartwick Lake	II-1	Wasipinicon River			Shooting, Refuge	Yes
78	Des Moines	Veteran's Lake, Burlington	II-6	10	4	Yes	Refuge, Nesting	No
79	"	Allen Green Slough	I-1	85	35	No	Refuge, Nesting	No
80	"	Walton's Pond, Burlington	II-6	20	7	Yes	Refuge	No
81	"	Mullehey's Lake, "	II-6	50	5	No		No
82	Dickinson	Christopherson's Slough	II-1	170	140		Breeding, Refuge	No
83	"	Jammerson's Slough	I-2	100	Dry No		Breeding, Refuge	No
84	"	Gar, Lower Gar & Minne-						
		washta Lakes		Included with E. Okoboji				
85	"	Spirit Lake	I-1	5,684	5,660	Yes	Resting	Yes
86	"	East Okoboji Lake	I-1	1,875	1,875	Yes	Resting	Yes
87	"	West Okoboji Lake	I-1	3,788	3,939	Yes	Resting	Yes
88	"	Center Lake	I-1	329	264	Yes	Public Shooting	
89	"	Diamond Lake	I-1	166	111	Yes	Breeding	No
90	"	Walch Lake	I-1	75	57	Yes	Public Shooting	Yes
91	"	Marble Lake	I-1	175	175	Yes	Breeding, Shooting	Yes
92	"	Hottes Lake	I-1	312	312		Breeding, Refuge	
93	"	Swan Lake	I-1	371	298	Yes	Breeding, Refuge	Yes
94	"	Prairie Lake	I-1	136	103		Public Shooting	
95	"	Pleasant Lake	I-2	82	Dry No			No
96	"	Lilly Lake	II-2		Dry No			No
97	"	Four Mile Lake	I-1	219	185		Public Shooting	Yes
98	"	Grover Lake	II-2		Dry No		Breeding	No
99	"	Silver Lake	I-1	1,096	1,058	Yes	Resting, Shooting	Yes
100	"	Little Spirit Lake	I-1	214	50	Yes	Public Shooting	

Project Number	County	Name	Class.	Size		Fish	Waterfowl Evaluation Breeding, Refuge, or Public Shooting	Fishing Open to Public
				Total Area	Marsh or Water			
101	Dubuque	Crawley's Pond, Bernard	II-6	To be investigated				
102	Emmet	Eagle Lake	II-4		Dry	No		No
103	"	Gross Lake	I-4	179	Dry	No		No
104	"	Biggs Lake	I-4	135	Dry	No		No
105	"	Cheever Lake	I-1	288		No	Breeding, Refuge	No
106	"	Tuttle Lake	I-1	981	981	Yes	Resting	Yes
107	"	Iowa Lake	I-1	308	354	Yes	Resting	Yes
108	"	East Swan Lake	I-4	739	Dry	No		No
109	"	West Swan Lake	I-1	1,038	1,038	Yes	Breeding, Shooting	No
110	"	Mud Lake	I-1	421	363	Yes	Breeding	Yes
111	"	High Lake	I-1	467	451	Yes	Breeding, Refuge	Yes
112	"	Twelve Mile Lake	I-1	290	211	No	Breeding	No
113	"	Ryan Lake	I-4	360	Dry	No		No
114	"	Four Mile Lake		(See Dickinson Co.)				
115	Greene	Goose Lake	I-4		Drained			No
116	"	Spring Lake	II-1?	To be investigated				
117	"	Grand Junction Pond	II-6?	"	"			
118	Franklin	Breed's Lake	I-5	Under construction		Yes	Refuge, Shooting	
119	Fremont	Nishnabotna Forks	II-1	4,262			Refuge	Yes
120	"	Waubesa Lake	II-3?	1,043	Dry	No	Breeding, Refuge	Yes
121	"	Little Wall Lake	I-1	273	150	No	Public Shooting	No
122	Hamilton	Goose Lake	II-2	100	25	No		
123	"	Cairo Lake	II-3	Proposed restoration				
124	"	Cady Chase Slough	II-4		Drained			
125	"	Iowa Lake	II-4		Drained			
126	Hancock	Eagle Lake	I-1	906	837	No	Nesting, Refuge and Public Shooting	
127	"	Wood Lake	I-2	52	Dry	No	Nesting	
128	"	Crystal Lake	I-1	274	274	Yes		
129	"	East Twin Lake	I-1	193	184	Yes	Shooting	
129a	"	West Twin Lake	I-1	109	109	No	Refuge	
129a	Hardin	Pine Lake	I-1	500	100	Yes	Refuge	
130	Harrison	Smith Lake	II-1	160	60	Yes	Refuge	

Project Number	County	Name	Class.	Total Area	Marsh or Water	Fish	Waterfowl Evaluation Breeding, Refuge, or Public Shooting	Fishing Open to Public
131	Harrison	Noble's Lake	I-2	300	Dry	No	Refuge	
132	"	Round Lake	II-3	690	Dry	No	Refuge	
133	"	McWilliam's Slough	II-1	80		Yes	Refuge	
134	"	Soldier River	II-3	7,000			Refuge, Breeding	
135	"	Horseshoe Lake, Modale	II-2	300	Dry	No	Refuge	
136	Henry	New London Pond	II-6	80	35	Yes	Refuge	
137	Humboldt	Owl Lake	II-3	Proposed restoration				
138	Iowa	Iowa River, Marango	II-6	Iowa River		Yes	Refuge, Shooting	
139	"	Amana Lake	II-1	200	200			
140	"	Hughes Lake, Colfax	II-6	To be investigated				
141	Jasper	Fairfield Pond #1	II-6	97	11	Yes	Shooting	Yes-fee
142	Jefferson	Fairfield Pond #2	II-6	122	5	No	Shooting	No
143	"	Walton Lake, Fairfield	II-6	145	12	Yes	Refuge	Yes-fee
144	"	MacBride Lake	I-5	Under construction			Refuge	Yes
145	Johnson	Swan Lake	I-2	44	Dry	No		
146	"	Babcock Lake	I-2	To be investigated			Shooting & Refuge	No
147	"	Shallady Slough	II-1			No	Shooting	Yes
148	Keokuk	Bas Lake, Martinsburg	II-1	39	5	Yes	Shooting, Breeding, & Refuge	Yes
149	Kossuth	Goose Lake	I-1	103	103		Shooting	
150	"	Swag Lake	I-1	109	46	Yes	Refuge, Breeding	
151	"	Union Slough	II-1 & 3	Proposed restoration				
152	"	Bancroft Lake	II-4	Drained				
153	"	Eagle Lake	II-4	Drained				
154	"	Green Bay	II-1	7,000	3,000	Yes	Shooting, Refuge	No
155	Lee	Graham's Pond, Montrose	II-6	8 1/2	3	Yes		Yes-fee
156	"	Devil's Creek Slough	II-17	To be investigated			Refuge	Yes
157	"	Cedar Lake, Cedar Rapids	II-1	150	150	Yes	Shooting, Refuge	Yes
158	Linn	Cane's Marsh	II-1	1,500?	50	Yes	Refuge	No
159	Louisa	Iowa Slough	II-1	50	25	Yes	Refuge	Yes
160	"	Indian Slough	II-1	1,700	50	Yes	Nesting, Refuge	No
161	"	Old Bed Lake	II-1	100	75	Yes	Shooting	No
162	"	Odessa Lake	I-1	To be investigated				
163	"							

Project Number	County	Name	Class.	Size Total Marsh Area or Water	Fish	Waterfowl Evaluation Breeding, Refuge, or Public Shooting	Fishing Open to Public
164	Lucas	Crystal Lake, Chariton	II-6	266	50	Yes	Yes-See
165	"	City Res., Chariton	II-6	212	40	Refuge	Yes
166	"	Williamson Pond	II-6	86	35	Resting, Refuge	Yes
167	Mehaska	M & St. L. Pond, Oskaloosa	II-6	21	6	No	No
168	"	Lake Keomah	I-5	Under construction		Shooting	
169	"	Cockley Bottoms, Pella	II-4	Drained	1	Yes	Yes
170	Marion	Hamilton Pond	II-6	4			
171	Marshall	C.M. & St. P. & P., Rhodes	II-6	To be investigated		Breeding, Refuge	No
172	"	Goose Pond	II-2	250	20	No	Yes
173	Mills	Malvern Res.	II-6	1.2	1	Yes	Yes
174	"	Platte Refuge Area	II-1	5,000	1,000	Nesting, Refuge	No
175	"	Haynie Slough	II-2	300	Dry	Shooting, Refuge	Yes
176	Mitchell	Brownville Slough	II-1	250	40	Breeding, Refuge	No
177	Monona	Blue Lake	I-1	1,599		Refuge	Yes
178	"	Guard's Lake	II-1	480	25	Refuge, Breeding	No
179	"	Whiting Slough	II-1	7,000		Shooting	No
180	"	Badger Lake	II-2	200	Dry	Shooting, Breeding	No
181	"	Middle Missouri River Refuge	II-3	40,960		Refuge, Breeding	No
182	"	Lake Quinebaugh	II-4	Drained			No
183	"	Turin Refuge	II-4	Drained			No
184	Montgomery	Tarkio Creek Refuge, Red Oak	II-3	Proposed restoration		Refuge	No
185	"	King's Slough, Red Oak	II-2	30	Dry	No	No
186	"	Kozed Marsh, Red Oak	II-3	Proposed restoration		Public Shooting	No
187	Monroe	Brompton Ponds	II-6	10	3	Yes	No
188	"	Burton Res.	II-6	30	Dry	No	No
189	"	Consol Res.	II-6	20	Dry	No	No
190	"	Cotton Wood Park, Albia	II-6	53	25	Yes	Refuge
191	"	Country Club Pond, Albia	II-6	50	15	Yes	Refuge
192	"	City Res., Albia	II-6	123.9	35	Yes	Refuge
193	"	Templar Pond, Albia	II-6	4	4		Refuge
194	Muscatine	Cone Lake	II-1	75	50		No
196	"	Muscatine Slough	I-1	To be investigated			

Project Number	County	Name	Class.	Size		Fish	Waterfowl Evaluation		Fishing
				Total	Marsh or Water		Breeding, Refuge, or Public Shooting	Open to Public	
197	Muscatine	Pike Creek, Near Cone	II-1	50	50	Yes	Shooting	No	No
198	"	Lord's Marsh, Nichols	II-1	200	100	Yes	Refuge	No	No
199	O'Brien	O'Brien Res., Sanborn	II-6	To be investigated			Breeding, Refuge	No	No
200	Oscola	Rush Lake	I-2	359	Dry	No			
201	"	Iowa Lake	I-2	241	Dry	No			
202	"	Albert Grave's Pond	II-1	To be investigated					
203	Page	Grabill Lake	II-6	50	28, 5, 4	Yes	Nesting, Refuge		
204	"	Porter's Lake	II-6	200	5	Yes	Artificial Feeding		
205	Palo Alto	Brown's Slough	II-1						
206	"	Medium Lake	I-1	991	991	Yes	Breeding, Refuge, Shooting	Yes	Yes
207	"	Silver Lake	I-1	884	667	Yes	Breeding, Shooting	Yes	Yes
208	"	Rush Lake	I-1	785	460	Yes	Breeding, Refuge, Shooting	Yes	Yes
209	"	Lost Island Lake	I-1	(See Clay County)			Public Shooting	Yes	Yes
210	"	Virgin Lake	II-4	262	200	Yes			
211	Pottawatomie	Elbow Lake	I-1	Drained					
212	"	Clear Lake	I-1	571	165	Yes	Public Shooting, Breeding	Yes	Yes
213	"	Lizard Lake	I-1	485	251	Yes	Breeding, Refuge	Yes	Yes
214	"	Sunken Grove	II-1	731	No	No	Breeding, Refuge	No	No
215	"	Burn's Slough	II-1				Public Shooting		
216	"	Swan Lake	II-4	Drained					
217	Polk	Avon Lake	II-6	88	5	Yes	Refuge, Nesting	No	No
218	"	Brenton's Slough	II-1	700	30	No	Refuge, Nesting	No	No
219	"	Stall Gun Club Pond	II-6	10	3	No	Refuge, Nesting	Yes	Yes
220	"	Water Works Lake	II-6	1,042	25	No	Public Shooting	No	No
221	"	Fisher's Lake	II-2	100	Dry	No			
222	Pottawattami	Garr Lake	I-2	90	Dry	No	Being restored at this time		
223	"	Lake Manawa	I-2	Dry		No	Refuge, Public Shooting	Yes	Yes
224	"	Carter Lake	II-1	150	150	Yes	Proposed Refuge		
	"	Noble's Lake		(See Harrison Co.)					
	"	Honey Creek	II-3	Proposed restoration					

Project Number	County	Name	Class.	Size		Fish	Wet erowl Evaluation		Fishing
				Total Area	Marsh or Water		Breeding, or Public Shooting	Open to Public	
226	Pottawattamie	Lake View Lagoon, Council Bluffs	II-1	To be investigated					
226	Potoshiek	M. & St. L. Pond, Grinnell	II-6	20	3	Yes	Refuge		No
227	"	Arbor Lake, Grinnell	II-6	50	5	Yes	Hunting		
229	Ringgold	Luke E. Hart Pond	II-6	20	4	Yes	Public Shooting		Yes
229	"	Mt. Ayr Res.	II-6	40	5	Yes	Shooting		
230	Sac	Black Hawk Lake	I-1	937	500	Yes			
231	"	McGree Slough	II-2	To be investigated					
232	"	Goose Pond	II-3	Proposed restoration					
233	"	Lake View Gravel Pits	I-1	147	50	Yes	Refuge		
234	Shelby	Nishnabotna River Pond, Avoca	II-2	To be investigated					
235	"	Water Works Pond, Harlan	II-6	To be investigated			Not investigated		
236	Tama	Cherry Lake	II-6	To be investigated					
237	"	Wolf Creek, Dysart	II-3	Wolf Creek		Yes			
238	Taylor	Cliff Beach Pond	II-7	1 1/2	1 1/2	Yes			
239	"	Meadow Lake	II-6	10	3	Yes	Public Shooting		
240	"	Lennon Res.	II-6	169	48	Yes	Public Shooting		
241	Union	Thayer Lake	II-6	75	12	Yes	Public Shooting		
242	"	Summit Lake	II-6	200	10	Yes	Refuge, Nesting		Yes
243	"	Mokinley Lake, Creston	II-6	80	18	Yes	Public Shooting		
244	Van Buren	C. B. & Q. Res., Milton	II-7	7	Dry	No	Refuge		
245	"	Campbell Pond, Mt. Zion	II-6	1	1	Yes			
247	Warren	Indianola Lagoon	II-6	10	1	Yes	Public Shooting		
248	"	Coal Creek Res., Beach	II-6	200	170	Yes			
249	"	Indianola Lake	I-5	Under construction					
250	Washington	Rock Island Res.	II-6	7	1 1/2	Yes	Public Shooting		
251	Wayne	Rumeston Res.	II-7	7 1/2	Dry	No			
252	"	Seymour Res.	II-6	To be investigated			Refuge		
253	"	Promise City Res.	II-6	7	3	Yes	Public Shooting		
254	"	Harvard Res.	II-6	57	10	Yes	Refuge		
255	"	Allerton Res.	II-6	350	80	Yes	Refuge		
256	"	Sewall Res.	II-6	25	15	Yes			
257	"	Kipper Pond	II-6	3	3	Yes	Refuge		
258	"	Corydon Res.	II-6	130	40	Yes			

Project Number	County	Name	Class.	Size Total Marsh Area or Water	Fish	Waterfowl Evaluation Breeding, Refuge, or Public Shooting	Fishing Open to Public
259	Winnebago	Hamon Lake	II-2	To be investigated			
260	"	Rice Lake	I-1	612 40	Yes	Breeding, Refuge	
261	"	Bear Lake	II-2	To be investigated			
262	Woodbury	Brown's Lake	I-1	840 100	Yes	Refuge	Yes
263	"	New Lake	II-1	100 25	No	Public Shooting	
264	"	Brower's Lake	II-2	180 Dry	No	Nesting, Refuge	
	"	Middle Missouri Refuge		(See Monona County)			
265	"	Bronson Refuge	II-2	80 Dry	No	Refuge	
266	"	Anthony Refuge	II-3	Proposed Restoration			
267	"	Hornick Refuge	II-3	Proposed Restoration			
	Worth	Rice Lake		(See Winnebago County)			
268	"	Silver Lake	I-1	318 310	Yes	Breeding, Refuge, & Shooting	Yes
269	"	Bright's Lake	I-4	Drained			
270	Wright	Cornelia Lake	I-1	285 262	Yes	Shooting	
271	"	Elm Lake	I-1	463 -	Yes	Nesting, Refuge	Yes
272	"	Wall Lake	I-2	905 Dry	No	Nesting, Refuge, & Shooting	
273	"	Morse Lake	I-1	108 100	Yes	Shooting	No
274	"	Dow's Sand Pit	II-6	To be investigated			

FEDERAL WATERS AND LANDS IN IOWA

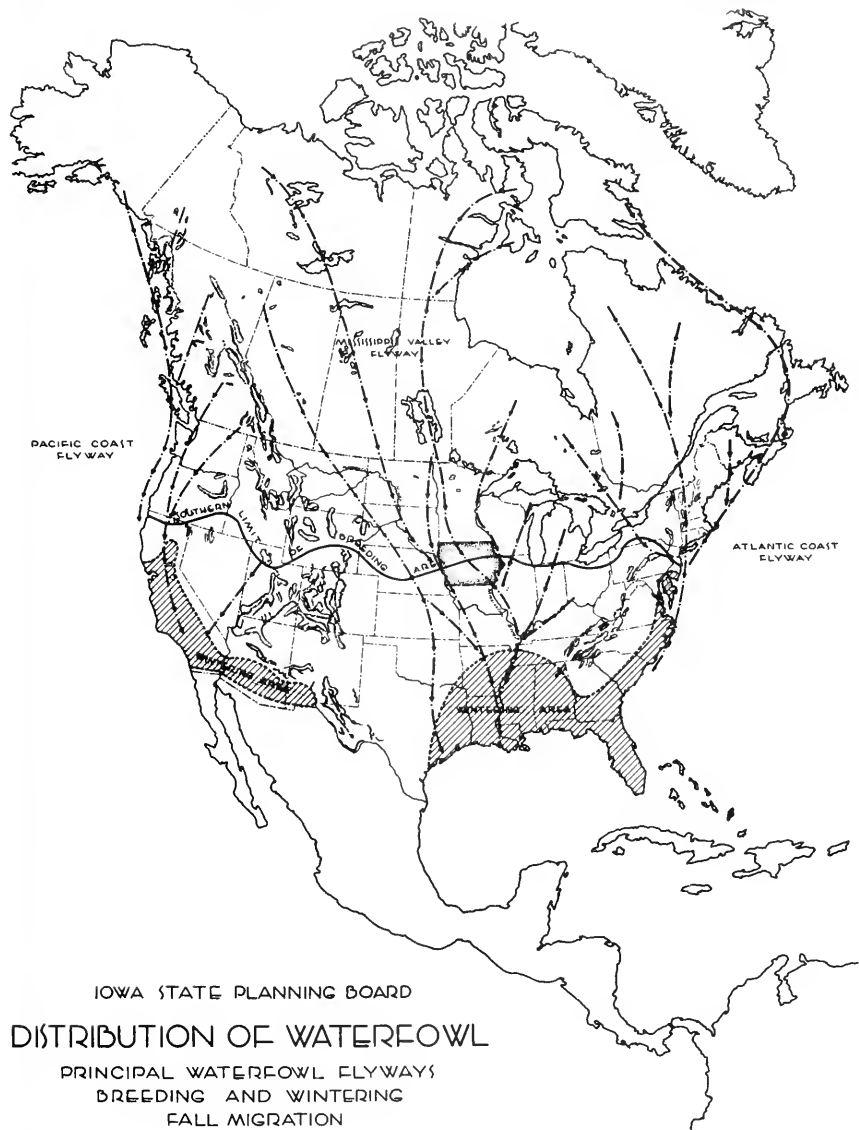
Number	County	Area	Use
F 1	Allamakee	( 9,479.54	Refuge, Breeding
F 2	"	(	Refuge, Breeding
F 3	Clayton	(	Refuge, Public Shooting
F 4	"	( 6,800.94	Refuge
F 5	"	(	Refuge, Public Shooting
F 6	Dubuque	971.23	Refuge
F 7	Jackson	3,866.41	Refuge, Breeding and Public Shooting
F 8	Clinton	2,100.47	Refuge, Breeding and Public Shooting
F 9	Scott	373.66	Refuge, Public Shooting

DISTRIBUTION OF WATERFOWL

Fig. 1035-3

The normal breeding grounds of waterfowl extend southward into northern Iowa. This formerly was one of the most important producing areas in North America. At the time of spring and fall migration, countless numbers of birds visit Iowa while following the Mississippi River Valley flyway. By the provision of refuges and the development of breeding grounds many may be induced to stay.

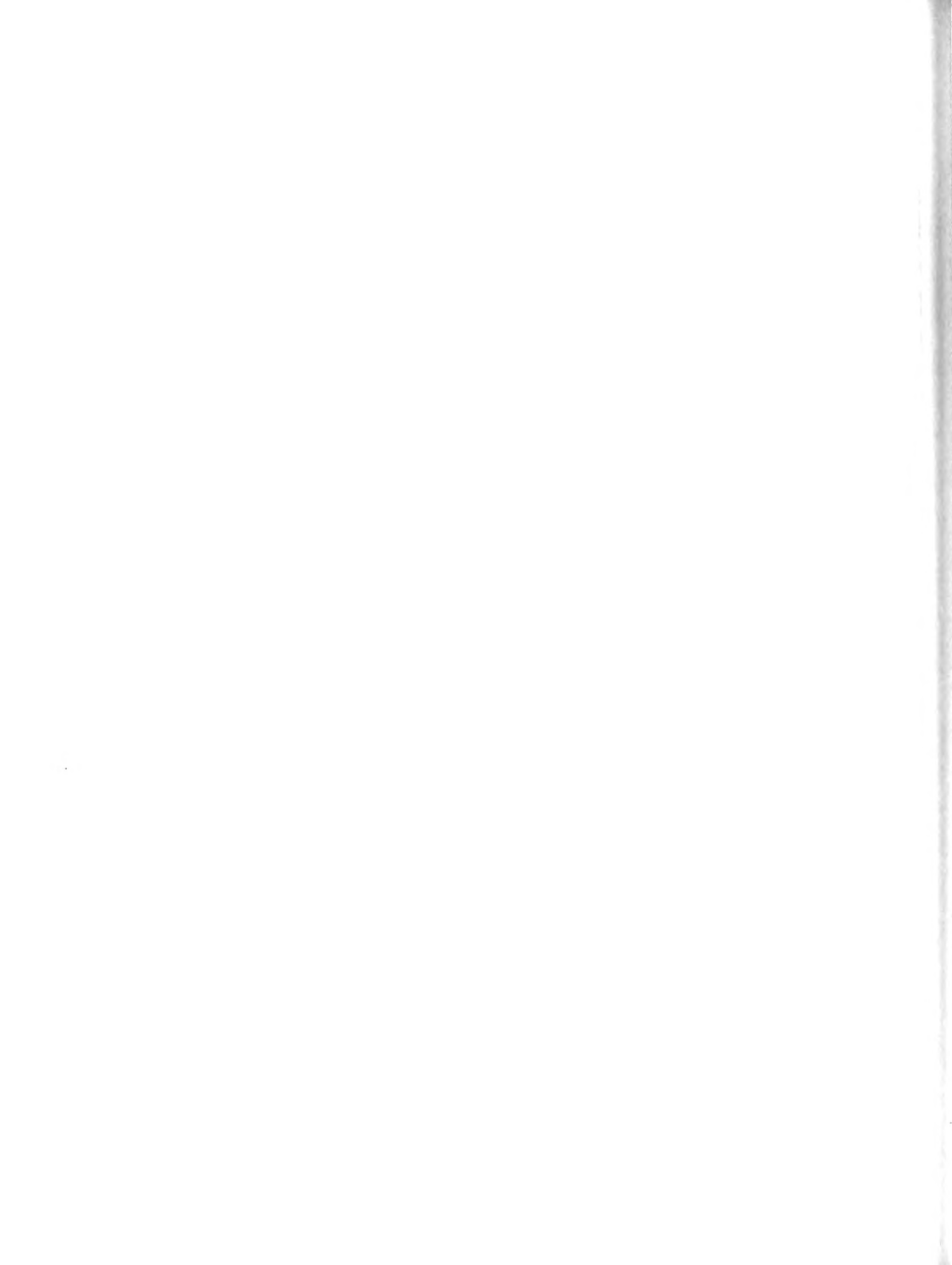




IOWA STATE PLANNING BOARD  
 DISTRIBUTION OF WATERFOWL  
 PRINCIPAL WATERFOWL FLYWAYS  
 BREEDING AND WINTERING  
 FALL MIGRATION

THE COMMITTEE ON  
 FISH & GAME  
 PROJECT 1035

1035-3



by the Federal, State and local organizations.

#### SURVEY OF RESERVOIRS, PONDS, AND GRAVEL PITS

The natural lake area in Iowa is practically restricted to that region formerly covered by the Wisconsin glaciation; consequently, all of southern Iowa and especially the southwestern quarter of the state is practically devoid of natural waters. Towns in this portion of the state have depended almost entirely upon small ponds or reservoirs for their water supply. A number of these have been developed with natural settings and as a result, these areas afford not only a water supply but provide recreational facilities as well.

The importance of these water supplies has been forcefully demonstrated during the drouth conditions of the summer of 1934. A number of the smaller bodies of water were entirely dry and even the larger areas were at critical stages.

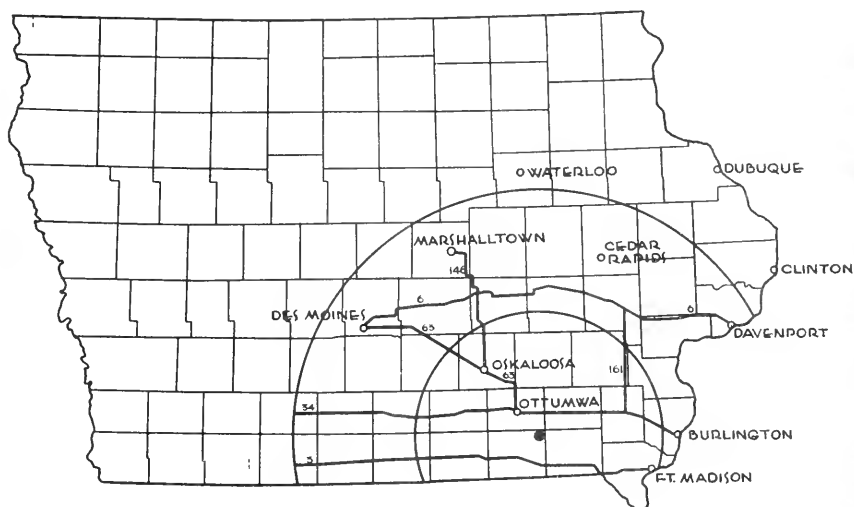
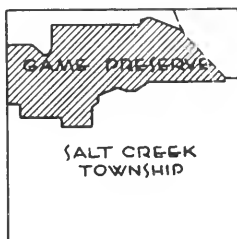
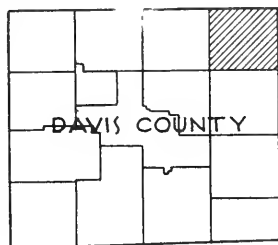
It has been the purpose of this survey to classify and evaluate all of these areas. The data resulting from this study are included in the following summary of water areas. The location and present condition of each unit is shown on map No. 1035-1 and its recommended use in the long-time conservation and recreational program is shown on Figure No. 1035-2. It has been highly important to have this comparative study of rather neglected regions so that a balanced acquisition and developmental program might be instigated.

As an immediate result of this survey a demonstration project of land and water uses has been set up utilizing the larger and best fitted reservoirs

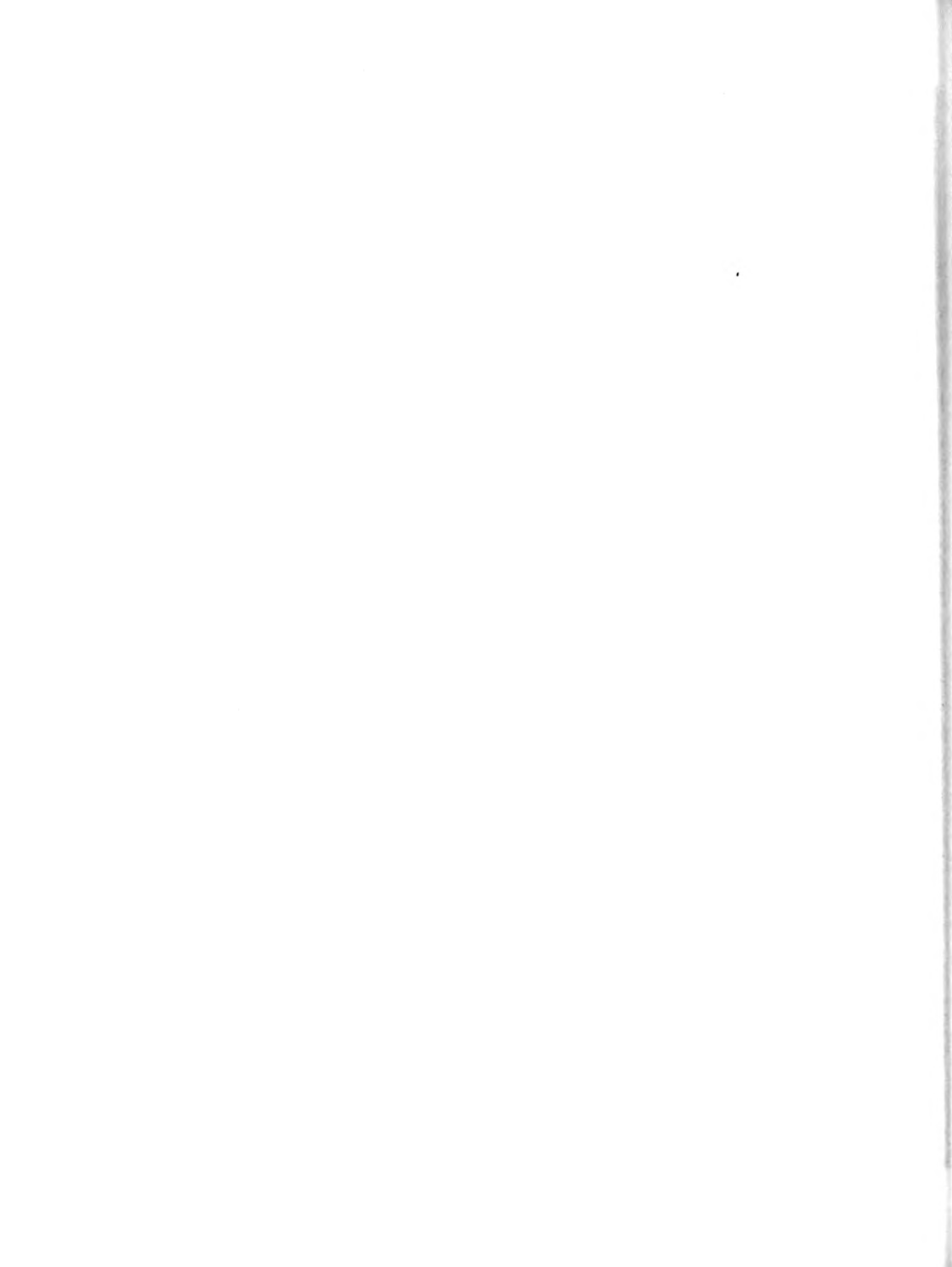
LOCATION MAP OF SALT CREEK TOWNSHIP

Fig. 1035-4

The 5,000 acre demonstration intensive game production project is located in Salt Creek Township, northeastern Davis County, Iowa. This proposed development may be repeated on at least 100,000 acres in Davis County and in all of the counties of southern Iowa. This new use of sub-marginal land is not alone a financially sound program for replacing agriculture but is a corrective plan for control of erosion.



LOCATION MAP  
 SHOWING RELATION OF SALT CREEK  
 GAME PRESERVE TO THE  
 STATE OF IOWA



and game areas in southern Iowa for waterfowl and game refuges during the winter of 1934-35.

The proposed feeding program, utilizing relief labor will demonstrate the feasible use of small bodies of water as refuges for waterfowl. This is highly important in southern Iowa where practically all waters are privately owned.

The program of feeding on game management areas, being worked out jointly with representatives of the National Forestry Service, National Park Service, and the Iowa State Planning Board, will demonstrate the important land use of such areas as the Salt Creek Project.

#### GAME AREAS

The survey of Forests and Waste Lands, Iowa State Planning Board Project No. 1033, is correlated directly with the program of the Iowa Fish and Game Commission.

During the course of the field work in connection with the Forestry Survey, estimates were made as to the potential game cover of each area.

Therefore, the recommendations of lands for National forestry acquisition, as shown on Figure No. 1033-1, are endorsed by the Iowa Fish and Game Commission as being highly desirable for wild life areas.

PART TIME FARMING IN IOWA  
Project 1032

It has been recommended by some to establish those families whose income is not sufficient, because of a short term of annual employment, upon small acreages adjoining the center of population within which they work. Here they may raise much of the food stuff needed by the family and probably sell some to supplement their income. If additional economic benefits can be derived by introducing such part time farming and yet maintain among these families a high standard of living, creating desirable educational and social opportunities, the plan appears to be a good one.

Object of the Study

It is the objective of the present study to examine the present extent and conditions of part time farming in Iowa, to characterize this development and to decide how far and under what conditions part time farming may be extended.

This study is chiefly concerned with the contribution part time farming made in 1933 to the subsistence of a group of 829 part time farming families. Some information was also gathered concerning their standard of living.

Part time farming areas surrounding seven cities in Iowa were chosen as a basis for the study. Cities selected were chosen because of their typical Iowa industrial situation.

The area within which the part time farmers are located does not make a regular pattern about a city. Such patterns outlined by the part time farming areas of the various chosen cities have no uniformity. These areas tend to concentrate along good roads, as near as possible to work centers



● P L A N N I N G   A   B E T T E R   I O W A   ●

and close to schools and churches. The cases were selected from townships about cities having the largest number of part time farmers. The localities selected were chosen after careful examination. Other Iowa cities in the northern and western part of the state were included in plans for the survey which failed to materialize because of lack of time.

TABLE 1032-A

LOCATION OF TERRITORIES USED IN THE STUDY AND THE  
POPULATION OF THE NEARBY CITIES

County	Township	Cities	
		Name	Population
Appanoose	Walnut	Centerville	8,147
	Bellair		
Black Hawk	Waterloo	Waterloo	46,191
	Cedar Falls		
	Washington		
Des Moines	Concordia	Burlington	26,755
	Flint River		
	City of Burlington		
Dubuque	Jefferson	Dubuque	41,679
	Table Mound		
	Peru		
	City of Dubuque		
Mahaska	Lincoln	Oskaloosa	10,123
	Garfield		
	Oskaloosa		
	Madison		
	Spring Creek		
Wapello	Center	Ottumwa	28,075
	Dahlander		
Linn	College	Cedar Rapids	56,097
	Clinton		
	Marion		
	Cedar		
	Burtram		
	Rapids		
	Monroe		

### Procedure

The head of every family that received part, but not all, of the family income from farming within the selected areas was interviewed. They were asked for the information contained in this report.

## CHARACTERISTICS OF PART TIME FARMING POPULATION

### Nationality

Twenty different nationalities were represented by the heads of the 829 families interviewed. Sixty-six and four tenths per cent of the heads of the families are American born. North, central and southern Europe contributed approximately the same proportion of the remaining families, while there were none reputed as coming from eastern Europe. Only two operators were negroes.

A greater proportion of the part time farming population is foreign born in those areas where intensified type of agriculture is practiced. For example, in Linn County many of the part time farm operators practicing an intensified type of gardening came from north western and central Europe. Mining is an occupation of the part time farmers in the area chosen for study in Appanoose County, and over one-third of them report coming from south western and southern Europe.

### Age Distribution

How does the age distribution of the part time farming population compare with the total population of the same counties?

Several of the counties have a pronounced difference in the percentage of some of the age groups of the part time farming and county population but

there are no differences within any one age group which are common to all counties. The distribution, including the total part time and county populations, give more significant differences. Here it is noticed that a greater per cent of the part time farming population than of the entire county population is within the older age intervals.

Does part time farming attract an older group than full time farming?

There is 1.9 per cent more of the all rural farming population in the 0 - 4 age period than of the part time farming population. In the 35 - 44 and 45 - 54 age periods, there are about 2.5 per cent more of the part time farming population than the all rural farm population of the same periods.

We can conclude that the general tendency is for part time farming to attract a slightly older group than full time farming. The cause for the fact is no doubt that some people move on a small acreage when they retire from farming or business.

It is interesting to compare the age distribution of the operators of the part time farms with the operators from the south east, north east and center sections of Iowa, surveyed by Harter and Stewart in 1928.<sup>(1)</sup> In this comparison there is a larger proportion of the operators of the part time farms within the 40 - 49 group than the operators of the full time farms, while the reverse is true in the 30 - 39 age period. The causes for those differences are not apparent. Table 1032-B shows this comparison.

- - - - -

(1) Computed from Wm. L. Harter and R. E. Stewart. The Population of Iowa, Its Composition and Changes. Agr. Exp. Sta. Bul. 275, 1928. Table IV. p. 18.

TABLE 1032-B

AGE OF THE OPERATORS OF PART TIME FARMS AND  
THE OPERATORS OF FULL TIME FARMS

(In the Three Sections of the State)

	Part Time Farmers		Full Time Farmers (1)	
	Number	Per cent	Number	Per cent
20 - 29	77	8.5	98	7.4
30 - 39	196	21.5	339	25.5
40 - 49	284	31.2	327	24.6
50 - 59	210	23.1	323	24.3
60 - 69	117	12.9	175	13.2
70 -	26	2.9	65	5.1

Size of Families

What size families are attracted by part time farming?

The greatest differences in this comparison are in the percentage of the time farming and total population in the families of one and two persons. Of the part time farming population only 2.7 per cent of the families were of one person and 18.7 per cent two persons, while of all families of the same area 7.8 per cent were of one person, 26.0 per cent two persons. A greater percentage of large families were found in the part time farming population than in the total population of the same area.

Two factors influence this difference, (1) urban centers afford little opportunity for children to contribute any financial aid to the family, while

on an acreage there are many jobs which they can do, (2) the opportunity to raise their own vegetables and fruits and to produce their own eggs and butter, means more to a large family; consequently part time farming is more attractive to such groups.

Table 1032-C gives the size of families of the part time farming and of the rural and urban population for the purpose of comparison.

The families of the part time farming population are larger than those of the urban population of the State. There is a slight difference between the size of families of the part time and of the total rural farm population for the same area.

#### FACILITIES FOR LIVING

It is hoped that with the increase of subsistence homesteading social contacts will not be lost. Good roads tend to aid in social stimulation.

In all of the counties except Black Hawk, better roads run past a greater proportion of the part time farms than of the total farms in the same area. This would be expected since better roads are usually found at the outskirts of the cities. Even with the above conditions about one-third of the part time farms of Black Hawk and Appanoose counties are located on unimproved dirt roads.

During approximately half the year, when dirt roads are in poor condition, families located on them are at a disadvantage in marketing their produce, in going to and from their work and in making social contact.

Generally, the roads indicate the general prosperity of the locality. The larger proportion of dirt roads are found in the areas having the part

TABLE 1032-C

SIZE OF FAMILIES OF THE PART TIME FARMING,  
AND OF THE RURAL AND URBAN POPULATIONS

Families Comprising	Part Time Farming Population		Total Population of areas (a)		Total Rural Farm Population of State		Total Urban Population of State	
	Number	Per cent	Number	Per cent	Number	Per cent	Number	Per cent
1	24	2.7	7039	7.8	8900	4.0	22160	8.4
2	169	18.7	23388	26.0	30322	18.3	73380	28.0
3	194	21.5	20470	32.8	45093	20.4	60697	23.1
4	189	20.9	15936	17.7	44031	19.9	46654	17.8
5	139	15.4	10167	11.3	32396	14.7	27823	10.6
6	85	9.4	5865	6.5	21247	9.6	15354	5.9
7	36	4.0	3194	3.6	12815	5.8	8004	3.1
8	34	3.8	1792	2.0	7499	3.4	4188	1.6
9	14	1.5	989	1.1	4294	1.9	2118	.8
10	14	1.5	492	.5	2306	1.0	1101	.4
11	2	.2	224	.2	1189	.5	466	.2
12	3	.3	209	.2	886	.4	409	.2

(a) United States Department of Commerce. Fifteenth Census of United States, Population Vol. IV, PP.437.

time famers with the smallest net income.

### School Facilities

It is interesting to note the school facilities available to the children of the part time farmers.

The elementary schools are located nearer to the homes than are the high schools. As would be expected, transportation is furnished more often by the secondary schools, but in only one-half the counties studied. In none of the areas studied is transportation regularly furnished pupils in elementary grades.

The large majority of the children of part time farmers attend one-room rural schools. These schools are located within convenient distance but do not afford the educational opportunities furnished by the city systems.

### Distances to Work

In order to reside on a small acreage it is usually necessary for these people to live some distance from their work.

The average number of miles to work varies from 3.7 miles for Wapello county to 1.2 miles for Appanoose county. Facts at hand do not explain this great variation. The average distance to work for all cases is 2.3 miles. With modern methods of transportation this distance can be covered with a small expenditure of time and money. Often several people living in the same neighborhood and working at the same, or nearby, locations ride together, thus reducing the individual cost of transportation.

### Organizational Membership

Are the residents of these small acreages active citizens in their

communities? This is determined by an analysis of their membership in various organizations.

The average membership for those reporting varies from 1 to 1.75 organizations for each individual. Less than 10 per cent of the children of all the families studied report memberships, and in Wapello, Des Moines, Black Hawk and Mahaska counties less than 3 per cent of the children report memberships. Also, about one-third of the husbands and two-thirds of the wives are affiliated with no organizations.

This analysis indicates that the social activities of the part time farming families are undeveloped. To many families the job of making a living is such a serious and difficult task that there is little opportunity for social intercourse. The economic conditions of these people and their general standard of living must first be improved before community interests can be stimulated.

### Housing

Some interesting data were gathered concerning the type and condition of the houses in which the part time farmers live.

The majority of the houses were of frame structure. A large percentage are in need of repair, especially in Appanoose county where 50 per cent of the houses were reported in poor condition.

Many of the houses which were reported in need of repair were built very poorly and actually were unfit for occupancy from the beginning. Scraps of lumber, tar paper and tin road signs were often used as building material. This was especially true in Appanoose county. Economic necessity has forced many of the part time farming families to locate on acreages. Consequently



their financial resources did not permit the building of good houses.

The frame houses were in poorer repair than other types. The brick, stucco and stone houses are the newer dwellings and people who build this type usually have the resources to construct them well.

#### Conveniences

Information was gathered concerning the following home conveniences: running water in the house; inside toilet; outside toilet; automobile and radio.

In Des Moines county 44.8 per cent of the 58 houses had running water, while in Appanoose county 2.4 per cent of the 83 cases were so equipped. No homestead in Appanoose county reported an inside toilet, while over one-third of the homes of Des Moines, Black Hawk and Mahaska has this convenience. Appanoose county also had the smallest percentage of automobiles and radios.

The standard of living of the part time farmers as measured by the occurrence of modern conveniences is low. The cause is due to the financial circumstances of many of the people who live on acreages. Their standard of living would no doubt be as undeveloped if they lived in the city. In order to improve this condition an increase in the family income is necessary. Many of them are receiving little income outside of their farming enterprise and until they have regularity of part time employment to supplement their agricultural income little can be hoped for in the way of improved conditions.

#### INCOME

##### Source of Income Other Than Agriculture

All types of occupations are represented by the part time farming popu-

lation.

With the exception of Appanoose county, a greater percentage of the parents work in manufacturing and mechanical industries than in any other class of occupation. In Appanoose county over three-fourths of the parents are employed in the mines. Considering all of the seven counties, trades follow manufacturing and mechanical industries in representation, mining and transportation, and communication ranking next in order.

Thirty-five and one-tenth per cent of the working children are in manufacturing and mechanical industries and 23.2 per cent of them are in trades. The mines employ a larger percentage of the working children in Appanoose county, with professional service a poor second.

It is interesting to compare the occupations of the parents and children. Eight and nine-tenths per cent more of the parents than children are in manufacturing and mechanical occupations and over three times as many are in professional fields. In communication and transportation occupations there are four times as many children as parents, and two-thirds as many in the extraction of minerals.

Consideration of the causes for the differences in the choice of occupations by parents and children is of importance. Manufacturing and mechanical industries have been curtailing their programs during the past few years; and, since in the reduction of the number of employees those hired last are discharged first, only the older ones now remain. The field of transportation and communication has developed rapidly the past ten years and in hiring employees young men have been given preference. Also, the depression has not caused as great curtailment of the program as in most industries. The pro-

professional field requires a long period of training which increases the comparative age of those in the field so, of course, more parents than children were found in this field. In the last few years mining has not afforded the financial opportunities offered by other industries, consequently the children have entered more attractive fields.

Other Sources

Some of the families have sources of income other than those already discussed. Such sources include gas stations, keeping of boarders and lodgers, pensions and others. The average annual income for 1933 from all sources other than agriculture is given in Table 1032-D.

TABLE 1032-D

INCOME FROM SOURCES OTHER THAN AGRICULTURE

County	: : Number of : Families	: : Total Annual : Income for 1933	: : Average Annual : Income for 1933
Wapello	150	144,121.60	960.81
Des Moines	58	32,749.49	564.65
Black Hawk	120	96,203.00	801.69
Dubuque	67	54,519.40	813.72
Mahaska	68	61,000.17	897.06
Appanoose	83	15,810.26	190.49
Linn	281	179,244.45	637.88
Total	827	583,648.37	705.74

The low average family income from sources other than agriculture for Appanoose county is the most significant fact indicated by the above table. The coal mining industry offers little in the way of steady employment or large financial returns, in Iowa.

#### Tenure of Homesteads

Before considering the economic aspects of the part time farming enterprise, it probably is advantageous to consider the tenure of the homestead. To be of the greatest benefit, small acreages should contribute to the cultural development of the families and this can best be realized when such acreages are owned by the operators.

More than 60 per cent, or approximately two-thirds, of the part time farms in each of the seven counties are owned by the operators.

A greater proportion of the part time farms are owned by the operator than are all the farms in every county used in the study with the exception of Dubuque.

The difference in size of investment partially accounts for the larger percentage of ownership by the operators of part time farms than all farms of the same area.

#### Mobility

Have the operators been on the present homesteads for a long period of time or have they moved on recently? Some 43.3 per cent of the 829 families have been on their present homestead less than 5 years. Twenty-one and eight-tenths per cent moved on from 5 to 9 years ago. The data is not sufficient to determine whether the movement is due to families coming out from the city during the past few years or due to movement from one homestead to

another. However, it seems entirely safe to assume that most of the recent movers to part time farms came direct from the city.

Size of Homestead

The size of the homesteads vary from 80 acres to less than one acre. The average sizes for the different localities also vary widely. The size of the acreage is determined by the size and nearness of the city, the type of agriculture, the fertility of the soil and the amount of available time to apply to farming.

TABLE 1032-E  
SIZE OF HOMESTEADS

County	:	Number	:	Total Acreage	:	Average Acreage
Wapello	:	150	:	749.60	:	5.0
Des Moines	:	58	:	359.60	:	6.2
Black Hawk	:	120	:	790.56	:	6.6
Dubuque	:	68	:	444.47	:	6.5
Mahaska	:	68	:	1025.96	:	15.1
Appanoose	:	83	:	1694.50	:	20.4
Linn	:	282	:	1829.26	:	6.7
Total	:	829	:	6953.95	:	8.4

The average size part time farm of Wapello county is one-fourth as large as those of Appanoose county and one-third the size of those of Mahaska county. The homesteads bordering smaller urban centers have more

acres than those at the edge of larger cities. This is due to land being not as expensive and a less demand for food stuffs raised by intensified farming.

#### Value of the Homestead

In a study of part time farming it is important to consider the value of the land and buildings. See Table 1032-F.

The average value of the part time farms of Mahaska county is three times the value of such farms in Appanoose county. The houses in all of the counties are approximately one-half the value of the homesteads while the other buildings are evaluated from about one-third to one-ninth that of the house.

The value for some of the homesteads has of course increased because of added improvements, while for others it has decreased due to depreciation.

No doubt the general decline in land values from 1920 to 1931 influenced the change in value of some of the homesteads. Even with this influence Black Hawk, Dubuque and Mahaska counties indicate an increase in the average value.

#### Ownership

As previously mentioned, a high percentage of these part time farmers own their own acreages. Ownership may sometimes be incorrectly interpreted to indicate security. To own the homestead and be on the verge of losing it because of a heavy mortgage, means very little from the standpoint of security.

With the exception of Black Hawk those counties whose homesteads had the highest average value also have the greatest percentage of overdue mort-

TABLE 1032-F

## VALUE OF THE PART TIME FARMS

County	:Number:		: Value of Land		: Value of house		: Value of other		: Per cent of value of	
	: of		: and buildings		: buildings		: buildings		: land and buildings	
	:steads:		:Total:		:Average:		:Total:		:Average:	
Wapello	150	\$396830	\$2846	\$244415	\$1629	\$25980	\$197	61.6	7.4	
Des Moines	51	186536	3653	102275	1967	29241	573	53.8	15.7	
Black Hawk	120	527900	4399	284700	2392	56450	474	54.4	10.8	
Dubuque	65	227250	3496	150100	2309	22155	352	66.0	10.1	
Mahaska	68	287500	4228	140050	2059	33950	507	48.7	12.0	
Appanoose	82	97900	1194	39175	478	15190	185	40.0	15.5	
Linn	281	594495	2117	413175	1481	94847	379	70.0	17.9	
All Counties	817	2318711	2838	1273890	1686	277813	364	59.4	12.8	

gages. Appanoose county with its low land valuation has the lowest per cent of indebtedness.

#### Amount of Income

Most part time farmers are primarily interested in the economic benefits derived from these acreages. The majority of them would not have moved to the farms if they had not thought they would contribute to their yearly income. How great is the economic contribution?

The range in the average net agricultural income per acre of the counties is \$18.10 to \$128.45 with an average for all counties of \$74.68. The net income for Des Moines and Mahaska counties is more than 58 times as great as for Dubuque county.

It has been advocated by many people that one of the solutions to the employment problem is to move the unemployed to small acreages where, many believe, they can earn their entire living. Even if the net agricultural income of the families in this study were increased by the use of more fertile soil and improved methods of management, it still would not be sufficient to provide a high standard of living.

#### Source of Agricultural Income

In a study of part time farming it is important to consider what sources of income are profitable and the amount of emphasis to be placed on each.

In all counties, income from the dairy made the greatest financial contribution. This source produced 27.8 per cent of the total agricultural income, yet only about 50 per cent of the families kept dairy cows. Poultry raising in contributing 14.7 per cent to the total agricultural income ranked next to dairying. Approximately two-thirds of the homesteaders kept poultry.



Of the 829 families 651 raised vegetables, yet only 12 per cent of the total income came from that source. It has been the opinion of many people that gardening was the main source of agricultural income of those living on part time farms. They are even called by some "garden farmers". From the figures given in the table representing areas studied it might seem more proper to call them "dairy farmers". The facts are, however, that they are carrying on an adaptive type of general farming and from the figures given it is doubtful whether these people would ever become "garden farmers".

#### Distribution of the Agricultural Income

The distribution of the agricultural income varies widely between counties.

Sixty-two per cent of the families in Appanoose county lost money by part time farming. Forty and one-tenth per cent of the total number of families would have profited financially if they had not carried on farming. Part time farming must be considered as a part time business and for profit requires time, managerial ability and good facilities such as soil, tools and buildings. Some may wonder how it is possible to lose money in part time farming. Many gardens are failures after money has been invested in seeds and equipment; feed costs of livestock often run too high; a high mortality among young poultry is common, and money may be spent in producing surpluses which cannot be sold, at the cost of production.

#### Relation of Acreage to Non-Agricultural Income

If one intends to adopt part time farming, what size acreage will be most profitable?

It was found that the average net income is very much greater for home-

steads ranging from one and one-tenth to two acres than those of one acre or less. The general tendency of the net income is to increase rather rapidly as the size of acreage increases until the 14 acre size homestead is reached, when the increase becomes more gradual.

It must be remembered that this information can only be applied to localities having the same characteristics as are found in the four communities used in the above analysis. Localities like those of Appanoose county no doubt find larger acreages more profitable because of poorer and cheaper soil suitable to different crops and because of a different kind of market.

There were not a sufficient number of available cases representative of the Appanoose situation to place their incomes in a separate distribution.

It must also be remembered that, in order to make any size acreage profitable, there must be sufficient amount of available time to properly take care of it. Although the study seems to indicate that a large acreage is most profitable, it is more advisable for one to choose a small acreage if there is insufficient time to tend a larger one.

Difference in size of acreages found in various localities does not always mean that more time is available for the operation of farming in the sections having the larger acreages, but often, instead, that the type of agriculture employed is different, with the localities having the smaller acreages carrying on a more intensified system.

#### Total Income

In this discussion consideration has been given to the net agricultural and non-agricultural income of the part time farms but nothing has been said concerning their relationship. Table 1032-G deals with this question.

Twenty-five and seven-tenths per cent of the net income of the part time farms of Appanoose county came from agriculture while only twenty-two per cent of Dubuque county came from this source. Generally speaking, the counties having the highest non-agricultural income have the smallest percentage of the total income coming from agriculture.

The average net income from all sources for Appanoose county is \$256.00 and for Wapello county \$1,055.79. For the average of all counties the average income is \$790.80.

TABLE 1032-G

FAMILY NET INCOME FROM ALL SOURCES FOR THE PART  
TIME FARMING POPULATION FOR 1933.

County	:Number: : of : :Home- :steads:	:Average Income(1): :Non-Agri- : culture :	:Average : : Income : : Agri- : : culture :	:Average : : Income : : (all : : sources):	Per cent Agricultural Income is of the Average Total Income
Wapello	149	\$960.80	\$ 95.10	\$1055.90	9.0
Des Moines	56	564.60	121.50	686.10	17.7
Black Hawk	119	801.60	99.00	900.60	11.0
Dubuque	68	813.70	18.10	833.80	2.2
Mahaska	63	897.10	128.60	1025.70	12.5
Appanoose	83	190.50	66.10	256.60	25.7
Linn	277	637.90	48.00	685.90	7.0
Total	815	716.10	74.70	790.80	9.4

(1) Carried to nearest decimal.

RELIEF STATUS

The most talked of argument for the part time farming is that it would

provide a subsistence income and remove any existing need for relief. Table 1032-H gives the relief status of the families studied.

TABLE 1032-H  
RELIEF STATUS OF THE PART TIME FARMING FAMILIES

County	: :	Number of Cases	: :	Number on Relief	: :	Per Cent on Relief
Wapello		150		26		17.3
Des Moines		58		21		36.2
Black Hawk		120		15		12.5
Dubuque		68		10		14.7
Mahaska		68		2		2.9
Appanoose		83		35		42.2
Linn		282		65		23.1
Total		829		174		21.0

Twenty-one per cent of all families were on relief. This large percentage is partially due to lack of supplementary employment and partially to part time farming not making its expected contribution. It would be interesting to know what proportion of this group would have been on relief if they had not been on an acreage.

#### ADDITIONAL DATA

After analyzing the data collected on part time farming by the Civil Works Administration it was evident that some significant information had

not been collected, consequently a new questionnaire was developed. Information called for in this questionnaire was gathered from part time farmers located near Oelwein, Fort Dodge and Ames.

#### Attitude

The most interesting information brought out by this additional study was concerning the attitude of the families toward part time farming. Six questions of attitude were included in the questionnaire. It is interesting to note the reasons given for moving to part time farms.

Three-fourths of the part time farming families survey in Oelwein and Ames and one-half of those of Fort Dodge moved to an acreage in order to reduce the cost of living. These data substantiate our previous assumption that economic conditions forced many to move to acreages. In Fort Dodge, 24.4 per cent of the families moved to an acreage to have a more suitable environment to rear children, while only 4.4 per cent of the part time farming families studied near Oelwein and 5.9 per cent of those near Ames reported this reason. The problem of a suitable environment for children is greater in larger towns and, since Fort Dodge is three times the size of Ames, it would be expected that Fort Dodge would report more often the problem of environment for children. Eleven and eight-tenths per cent of the part time farmers of Ames, six and seven-tenths per cent of those of Fort Dodge and two and two-tenths per cent of those of Oelwein moved to acreages because they didn't like the city. A large percentage of the employed population of Ames comprises white collar workers who have steady employment. This is due to the location at Ames of the State Highway Commission and the Iowa State College. Many of these people can afford the luxury of living at the edge

of town on a well kept and rather elaborate homestead, consequently 11.7 per cent moved on an acreage because of not liking to live in a city.

The disadvantages reported by the part time farming families of living on an acreage are summarized in Table 1032-I. The reasons for the variations in these percentages are not apparent. Lack of modern conveniences was mentioned half as often by the part time farmers of Ames as those of Oelwein and Fort Dodge. The houses of Ames are more modern.

TABLE 1032-I  
REPORTED DISADVANTAGES OF LIVING  
ON A PART TIME FARM STUDIED

Disadvantages	: Oelwein :		: Fort Dodge :		: Ames :		: Total :	
	Number:	Percent:	Number:	Percent:	Number:	Percent:	Number:	Percent:
Lack of modern conveniences	9	20.0	13	26.0	2	11.8	24	21.4
Partial living			2	4.0			2	1.8
Too far from town	17	37.8	6	12.0	9	52.9	32	28.6
Fire protection			2	4.0			2	1.8
High taxes: Snow in winter	1	2.2	1	2.0			2	1.8
No economic benefits	9	20.0	1	2.0	1	5.9	11	9.8
School tuition	2	4.4					2	1.8
No disadvantages	7	15.6	25	50.0	5	29.4	37	33.0

Do the part time farmers think they are "better off" living on an acreage than living in town? More than 90 per cent of the families interviewed in Oelwein and Fort Dodge and over 75 per cent of those of Ames gave

part time farming the preference.

Evidently these people are sold on part time farming as a type of living, for two-thirds of them would not move to the city if they had an annual income of \$2,000.

Information collected on other phases of part time farming merely verifies the conclusions drawn from the previously analyzed data so it will not be discussed.

#### THE GRANGER PROJECT

No study of part time farming in Iowa would be complete without considering the experimental Federal Homesteading project at Granger. Granger, a town of about 350 inhabitants, is located approximately 20 miles northwest of Des Moines in the heart of a coal mining region. (See Figure 1032-1). At the northwest edge of the town 225 acres of fertile land has been bought by the Subsistence Homesteading Division of the Department of the Interior. This land has been divided into 50 plots of various sizes which range from 2.77 acres to 8.79 acres. A development plan for the entire project has been laid out by the Landscape Architecture Department at Iowa State College. The location for the houses and wells have been made and the plans for the houses selected. Four types of houses will be built, ranging in size from four to six rooms. The accompanying drawing shows the plan for the entire project and a typical layout. (Figure 1032-2).

Fifty families have been selected to occupy these acreages as soon as the dwellings are completed. These families were selected from those filing application on the basis of character and ability. It was the intention to

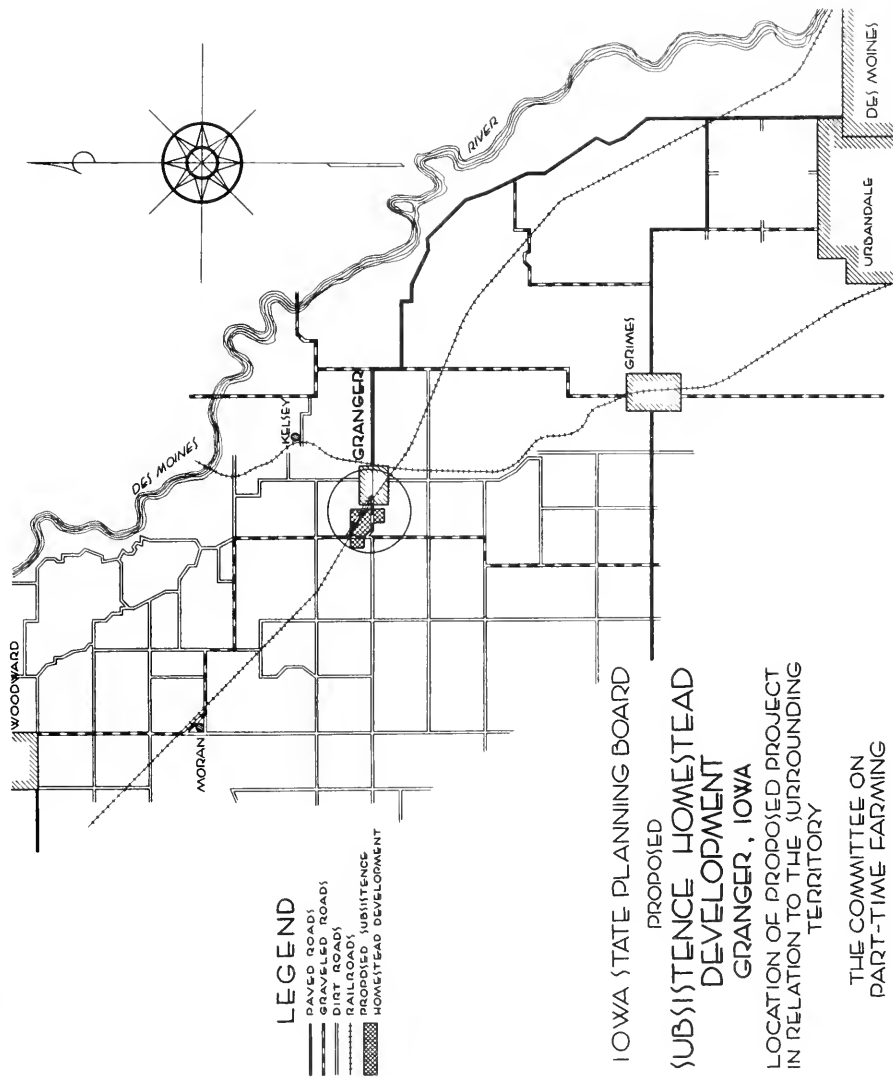
GARDEN FARMS-GRANGER

Fig. 1032-1

This key map shows the location of the town of Granger with reference to Des Moines and other cities of central Iowa, and the mining area of the district.

The proposed demonstration part-time farming project, now in the process of construction, adjoins the town of Granger on the west.

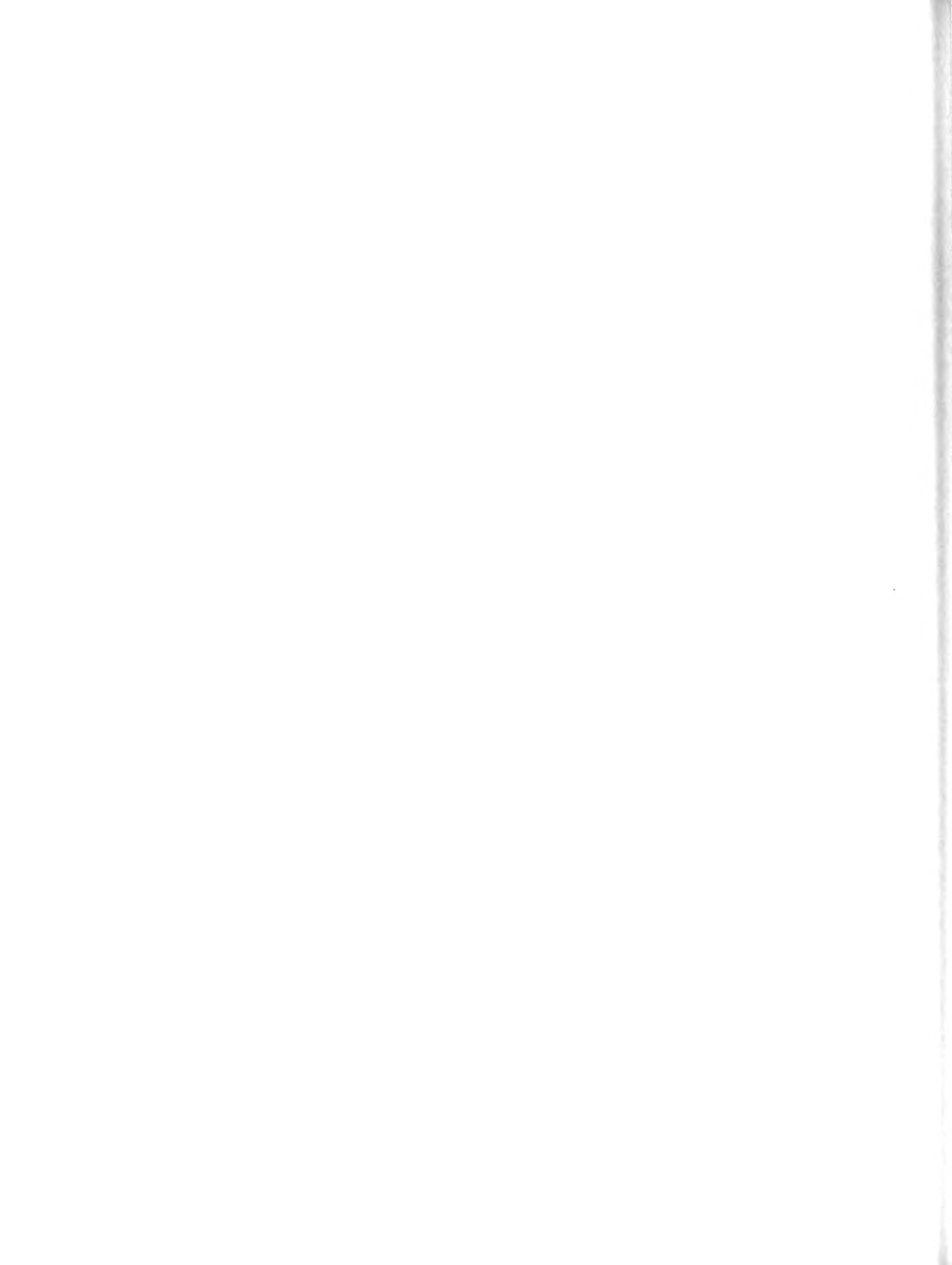




IOWA STATE PLANNING BOARD  
 PROPOSED  
 SUBSISTENCE HOMESTEAD  
 DEVELOPMENT  
 GRANGER, IOWA  
 LOCATION OF PROPOSED PROJECT  
 IN RELATION TO THE SURROUNDING  
 TERRITORY

THE COMMITTEE ON  
 PART-TIME FARMING  
 PROJECT 1032

1032-1



include only families that can pay for the acreage eventually. The size of plats and houses given each homesteader is determined by the size of the family. The cost of the acreage to the family is not to exceed \$2,400 and the families are allowed a long period of years at a low rate of interest in which to pay.

#### Contribution

What contribution is the Granger project making to part time farming?

In selecting families for this project the undesirable social element has not been included. Only the indutrious and more socially minded persons who can be developed into an organized social group have been selected for this project. This is of vital importance for a permanent part time farming community.

In the surrounding locality there is opportunity for part time work, particularly in the coal mines. In fact all of the families selected have part time work. They should be able to maintain a comfortable standard of living and eventually own their own home, giving these people the satisfaction of economic security.

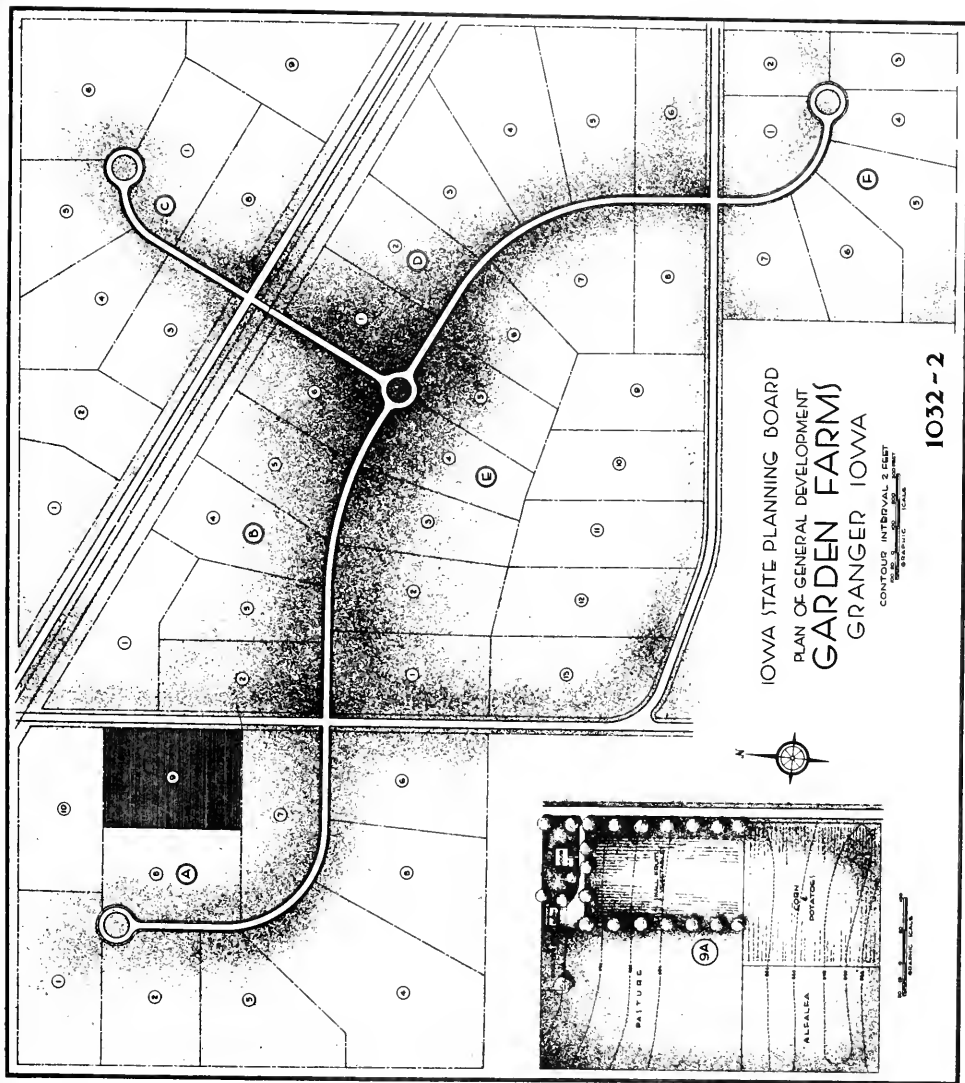
The land chosen for the plots is of high soil fertility. Unlike many of the areas chosen for part time farms, good farm land was selected rather than waste areas.

A Catholic parochial grade and high school and a public grade and high school is within reasonable distance of all of the plots. Church facilities are also adequately available. Definite plans concerning recreational opportunities have not yet been made. It is hoped, however, that a large

PLAN FOR GARDEN FARMS-GRANGER

Fig. 1032-2

This drawing shows the general plan for the part-time or garden farm project at Granger, together with a typical layout for one of the plots. These plots average about four acres each.





area near the plot may be presented for a park and playground. Many other recreational facilities could, with little expense, be provided.

#### SUMMARY AND CONCLUSIONS

Every town and city in Iowa has at its outskirts a number of small homesteads. The farming of these acreages supplements the income from one or more of the following sources: gainful employment outside the home, home industries, past savings or relief.

The number of these acreages is determined by the size of the urban centers, regularity of employment and the presence of odd pieces of land whose value for other purposes is low. The location of homesteads is determined by the location of suitable plots, by the process promotion made by land companies, and by the distance to places of employment. One and one-half miles is the average distance of the acreages from the city limits.

More than seventy per cent of the families have moved to the acreages because of economic conditions. A few within this percentage were forced off of farms but most of them moved out from the city in order to reduce the cost of living. Those who did not choose an acreage because of financial conditions gave as reasons, family circumstances, love for outdoor life, and improved facilities for rearing children in a desirable environment.

On a few of the acreages fine homes are found with well landscaped lawns and well kept out-buildings and fences, but most of them have poorly built houses, old sheds for out-buildings and weeds and trash about the yard. Those families that have located on an acreage because they prefer to

live there have the finer homesteads, while those who have been forced there because of financial circumstances have in many cases homesteads which are poorly built and badly kept.

Acreages located on the hillsides have a large proportion of the land in grape vineyards. On the lower flat acreages nearer the city, vegetables are the predominant source of agricultural income, while more diversification is practiced farther out from the city. A dairy cow is kept by about thirty per cent of the part time farmer's families. The better farmers provide in the layout of the acreage pasture for the cow while the less thrifty ones feed her on garden wastes from their own and neighbors acreages and by staking her out along ravines, roadsides and in vacant lots. Most of the families keep a few chickens and about twenty per cent of the families keep one or more hogs which are fed mainly garbage.

The size of the nearby urban centers influences the type of agriculture. At the edge of the smaller towns less gardening is carried on, and more hogs, dairy cattle and field crops are found. The acreages bordering the greater urban centers are smaller. Land is more expensive and the type of agriculture more intensified.

Although financial conditions made it necessary for a large percentage of the part time farmers to move to an acreage, the improvement of the financial circumstances would not cause them to move back to the city. In other words they believe in part time farming as a type of living.

More than 65 per cent of the acreages are owned by the operators, although in some localities more than 25 per cent of the purchase price is still due, while in other communities only about 10 per cent of indebted-



ness exists. The acreages in the poorer farming sections have a smaller percentage of indebtedness than those of more fertile sections. The house constitutes approximately 60 per cent of the investment, the out-buildings 15 per cent and the land 25 per cent.

A wide variation exists in the economic return received from the acreages. The amount of profit is determined by the extensiveness of the layout, the type of agriculture, the fertility of the soil, the market conditions, the weather conditions and the skill of the operators. Some have too many acres in gardens. In a small way they try to compete with the larger specialized and skilled gardener and as a result make very little profit. In most cases, however, the homesteads are making a contribution to the economic conditions of the family. This contribution could be increased by the improvement of the agricultural practices and by the selection of land which has high soil fertility rather than because it can be bought cheaply.

Regardless of whether part time farming is promoted, it will continue to grow in Iowa. The extent of its contribution will be determined by (1) the type of its people, (2) the fertility of the soil, (3) the opportunity for supplementary employment, and (4) the social opportunities provided.

In order for this group to contribute to American life, schools and recreational centers must be provided. If this is done and people of ability and responsibility locate on soil of rich fertility in localities where part time employment is certain, these localities will be made stable, happy communities which will make a contribution to American citizenship.

BOONE AREA

Topography Map

Fig. 1033-5

Opposite is shown a topographical indication for the entire Industrial Recreational Area. The rugged, semi-wooded and deeply eroded character of the region is quite evident.

IOWA STATE PLANNING BOARD

# INDUSTRIAL RECREATIONAL RESERVE

BOONE COUNTY, IOWA

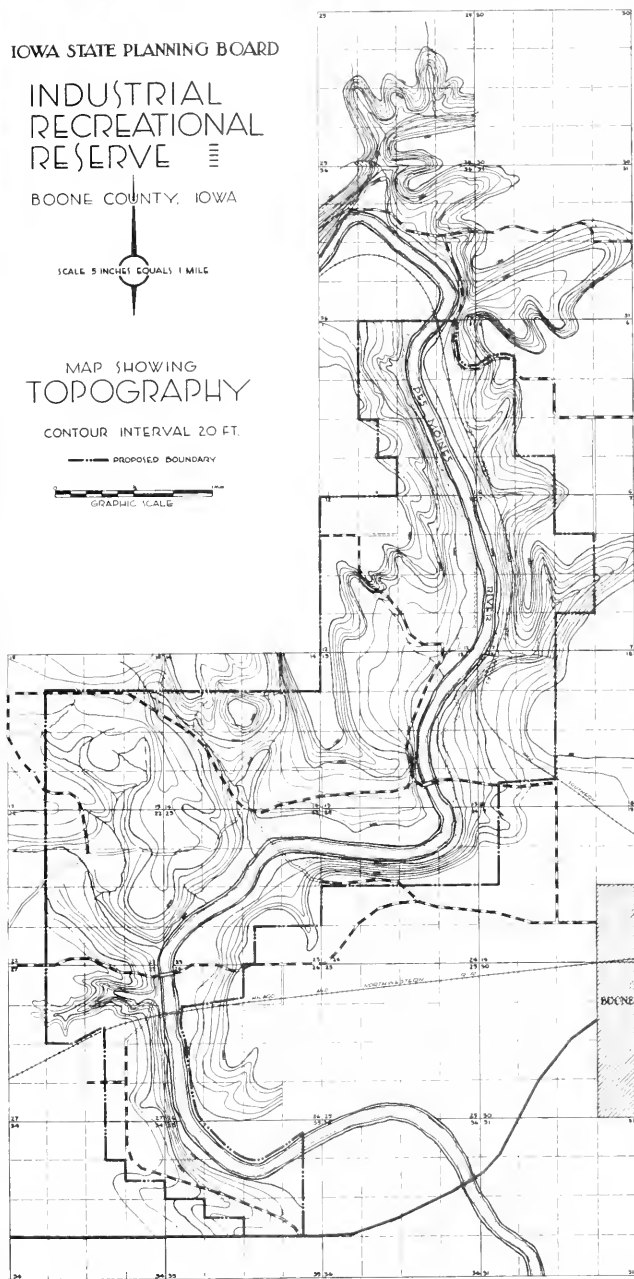
SCALE 5 INCHES EQUALS 1 MILE

MAP SHOWING  
TOPOGRAPHY

CONTOUR INTERVAL 20 FT.

--- PROPOSED BOUNDARY

GRAPHIC SCALE



1033-5



PROPOSED INDUSTRIAL RECREATIONAL RESERVE

BOONE COUNTY, IOWA

The appalling waste of our land, forests, and human energy through abuse and misuse of land has been a long standing national scandal. Now it seems the trend is turning toward the more intelligently planned use of our resources on a permanent basis. With this thought in mind the Iowa State Planning Board has studied a number of areas, the knowledge of which will lead to a more thorough understanding of conditions. Several of these are presented under various project headings throughout the report. The one following has been made a part of the Forest and Waste Land study.

In the proposed Industrial Recreational area near Boone, the Planning Board has found one of its first opportunities for putting into actual operation one of the major elements of the broad program of land use adjustments as outlined by the Land Policy Section of the A.A.A., and as sponsored by the National Park Service. (Figure 1035-5).

This proposed recreational area is within convenient access of about one-half million people, many thousands of whom are industrial workers who seldom have the opportunity for real recreation in a natural environment.

The area, for the most part, is distinctly sub-marginal in character with badly eroded and thinly timbered hills and valleys, and a sparse population eking out a miserable existence. In fact, the problem of human rehabilitation was one of the most important considerations in the selection of this particular tract for development.

BOONE AREA

Preliminary Plan

Fig. 1033-6

Though distinctly sub-marginal from an agricultural standpoint, this area presents unusual recreational possibilities. It will be noted that through traffic is discouraged in order to help preserve the natural character, especially about the Family Vacation Cabin camp colonies and the groups of fishermen's cottages.

A more concentrated central recreational area, quite remote from the wilder and more natural parts, is recommended.

INDUSTRIAL  
RECREATIONAL  
RESERVE

SCALE 5 INCHES EQUALS 1 MILE

GRAPHIC SCALE

MAP SHOWING  
PROPOSED  
DEVELOPMENT

**CABIN CAMP COLONY**

- 1 ASSEMBLY & COMMISSARY BUILDING
- 2 DIRECTOR & SERVICE GROUP
- 3 PLAYFIELD - 1 CHILDREN'S PLAYGROUND  
2 WADING POOL  
3 ADULT AREA
- 4 CABINS & COMBINATION SHOWERS  
AND COMFORT STATION
- 5 PARKING AREA
- 6 BOAT HOUSE

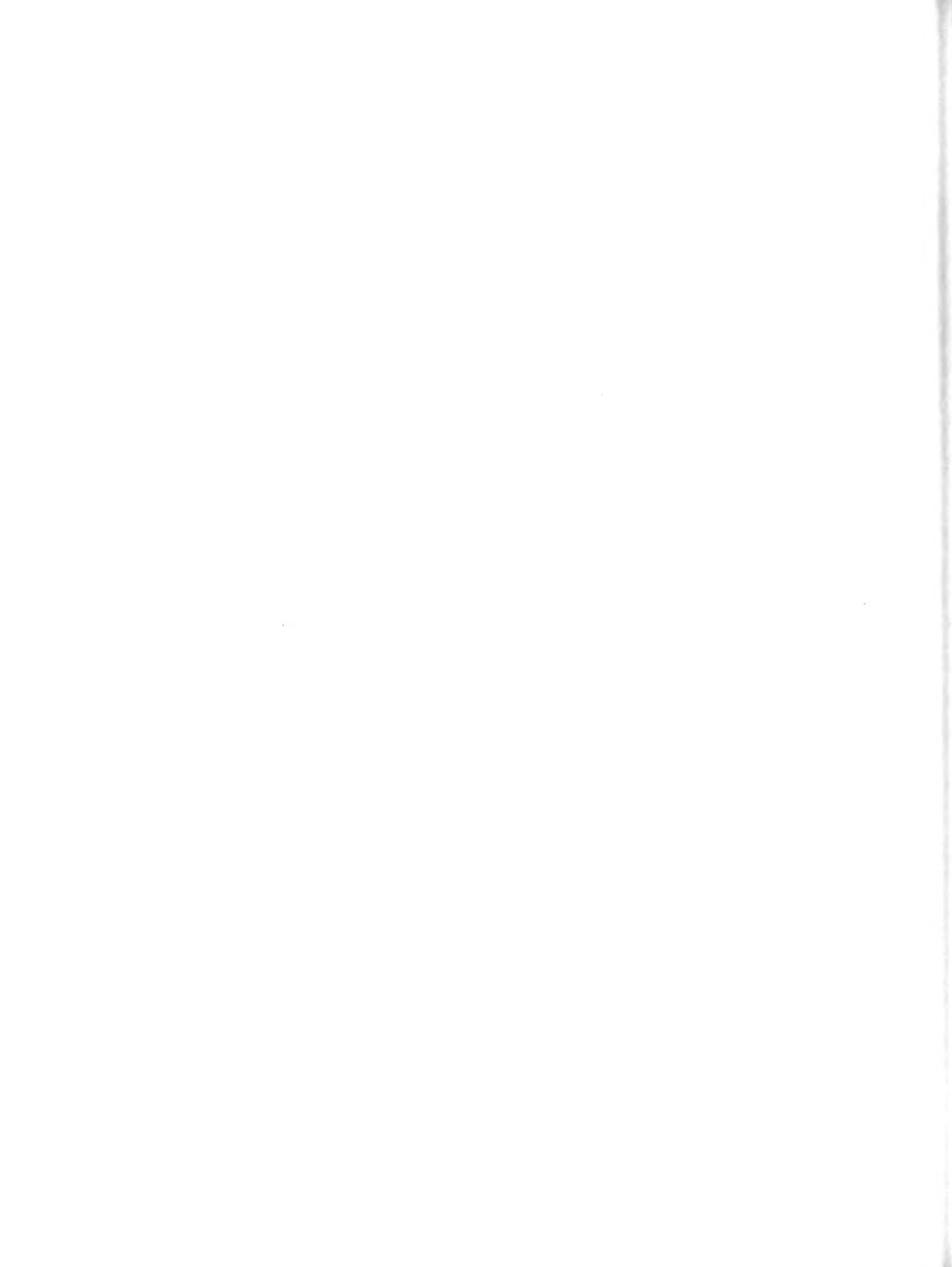
FISHERMAN'S VILLAGE

- 1 INN
- 2 SHOPS & GARAGE FACILITIES
- 3 SERVICE GROUP
- 4 COTTAGES
- 5 BOAT HOUSE

1. SHELTER
2. BATH HOUSE & SWIMMING POOL
3. OVER LOOK SHELTER
4. CONCESSIONNAIRE
5. CUSTODIAN'S GROUP
6. PLAY FIELD
7. PICNIC AREA
8. PARKING AREA

SOUTH ENTRANCE

1033-6





The region possesses outstanding scenic and recreational values. In the preparation of the preliminary plan for the development of the area all these natural advantages were considered. (Figure 1033-6).

The project application and report have been presented to the Iowa State Board of Conservation, which Board has agreed to accept the responsibility of operation, after the Federal Government, through the National Park Service, and the E.C.W. organization, has purchased the land, developed the recreational facilities, and the necessary rehabilitation program is in operation.

This project, though recreational in the nature of its development, because of the sub-marginal character of the land, was initiated through the Forest and Waste Lands Project 1033, under which the area was surveyed and the preliminary report prepared.

Other sub-marginal projects differing somewhat in character and purpose are discussed at length under other projects in this report. Included among these are the Wayside Parks which are considered under Zoning and Planning because of their recreational use. The important Davis County Game Production area is one of the major proposals for sub-marginal land acquisition. This unique proposal for adjustment in land use is presented in detail by the Biological Survey Project number 1035, elsewhere in this report.

The proposed industrial recreational area is located almost equal distance between the two state parks, Dolliver on the north and the Ledges to the south, both in the valley of the Des Moines river. This location will

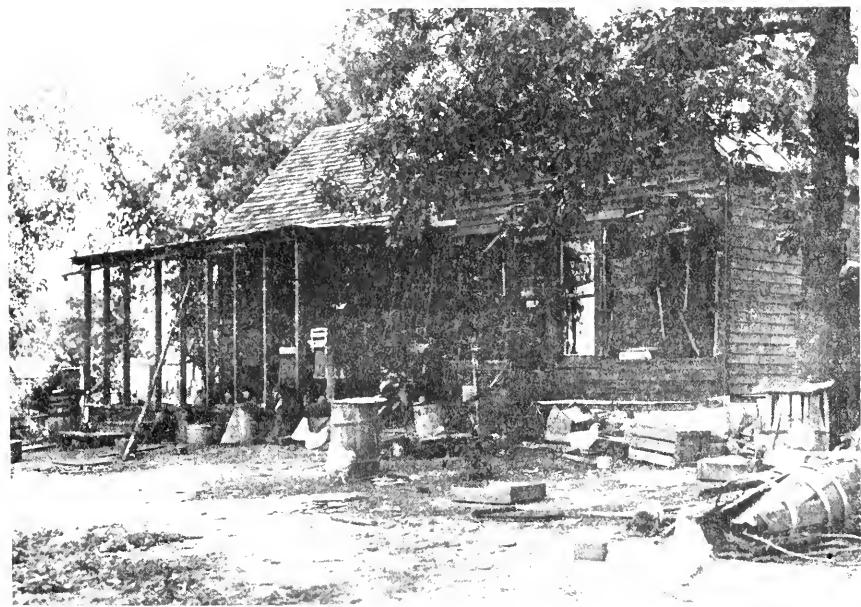
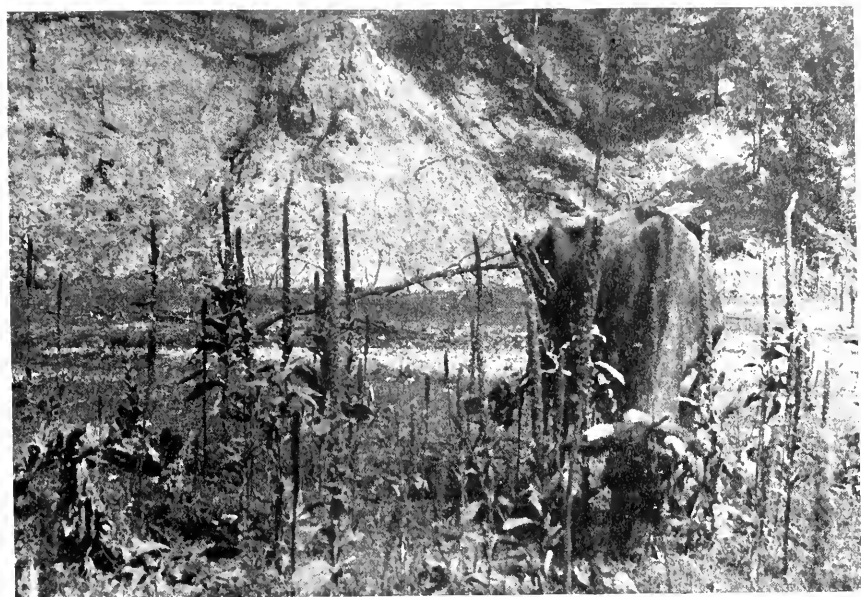
BOONE AREA

Sub-marginal Farming

Picture 1033-A

The dramatic story of erosion resulting from timber-cutting and overgrazing is told in the upper picture. The abuse of this land creates physical and economic jeopardy for other, perhaps better land above and below.

The lower picture shows an existence home in the Boone "Industrial Recreational Reserve". The occupants illustrate sub-marginal living; they have no hope at present either for security or for the bare necessities of life according to traditional American standards.





relieve the proposed park of much of the usual park patronage, reserving more definitely the use of the area as a semi-isolated family vacation recreation park.

The whole Des Moines River Valley possesses a rich and varied beauty quite unusual for central Iowa. This particular tract, located as it is in a rather narrow and hilly part of the valley, has many scenic attractions. The two selected pictures are quite typical of the restful scenic beauty of the region.



BOONE AREA

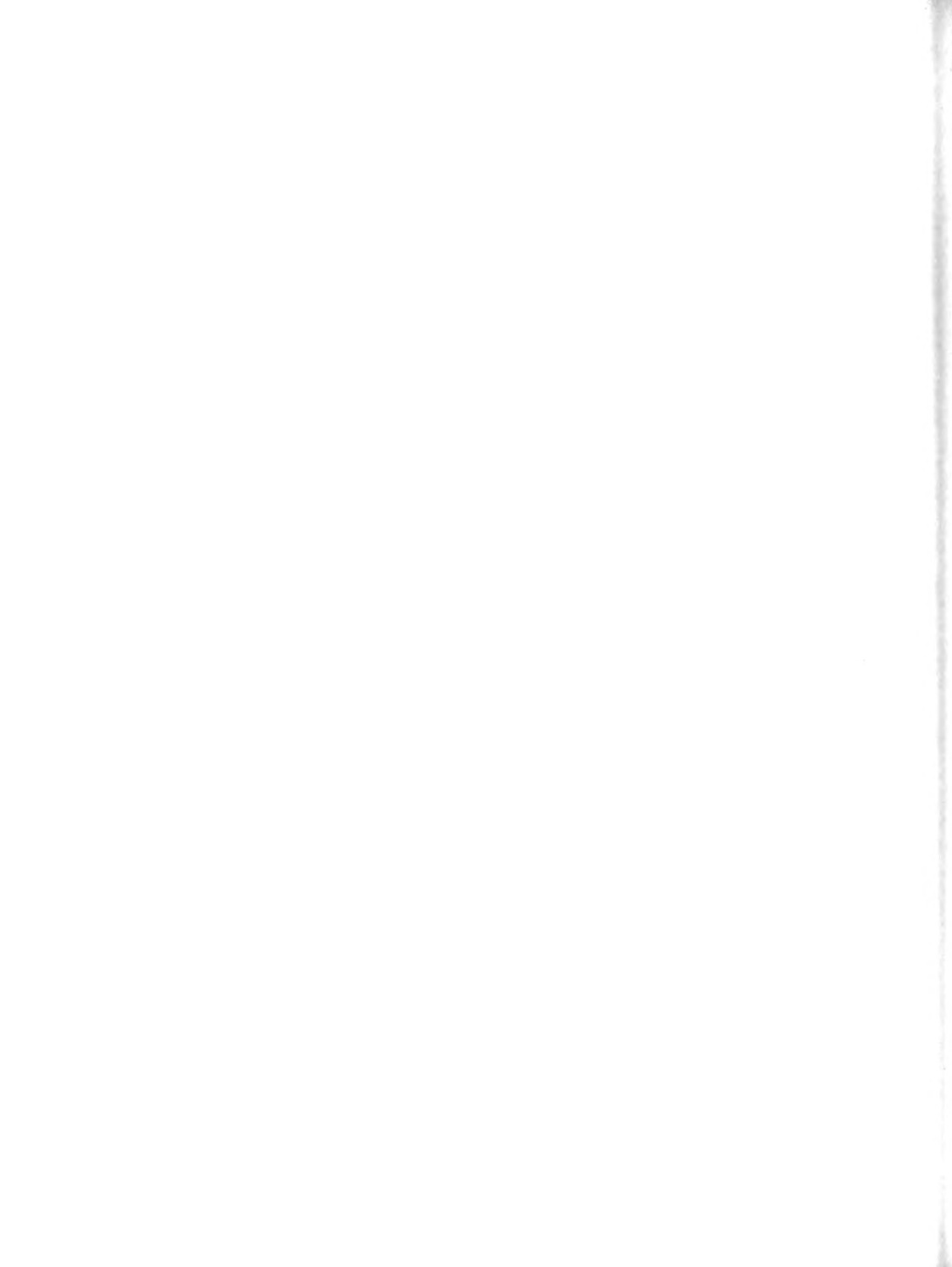
Recreational Landscape

Picture 1033-B

The upper view, taken from a point above Bluff Creek, shows the Des Moines River in the middle distance, the site selected for the large cabin camp on the hill to the left, and the picnic area beyond.

Below is a typical view of the Des Moines River as it passes through the Boone "Industrial Recreational Area". Here are great potentialities: boating, fishing, and quiet, secluded, luxurious beauty.









HISTORIC AND SCENIC

Project 1047

PLANNING BOARD COMMITTEE

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Mrs. Grace Gilbert King, State Board of Conservation, West Union  
Mrs. H. S. Vincent, Chairman Public Relations Project, Fort Dodge

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PROJECT SUPERVISOR

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J. R. Fitzsimmons, Landscape Architect, Board of Conservation, Ames  
E. R. Harlan, State Historical Department, Des Moines  
Mrs. Ralph Henderson, Member of Historical Society, Sioux City  
E. N. Hopkins, Better Homes and Gardens, Des Moines  
Mrs. L. B. Schmidt, Member of Historical Society, D. A. R., Ames  
B. F. Shambaugh, Head of Political Science, S. U. I., Iowa City

## HISTORIC AND SCENIC SPOTS

Iowa has not been the scene of great historic events; yet in the sequence of time it has had a history. Nor does Iowa possess scenic assets of outstanding grandeur; yet the placid beauty of its countryside lacks but appreciation, and opportunities for recreational development invite favorable comparison with most states.

### Historic

In the gathering of data relating to historic sites and objects it has been difficult to place an appraisal as to importance upon that which should be preserved because of the uniqueness of the occurrence to which it was related, as compared to that which symbolizes the mode of life of the home-steading Iowa pioneers.

By reason of the rapidity with which Iowa was settled—and because of the lack of permanence in the works of the early settlers—the history of Iowa can be said to be but transient; but it is hoped that it is not too late to preserve a few of those old schools and churches that meant so much to our fathers, those mills, taverns and inns that gave them shelter and service, and those faint imprints that have been left of the Mormon trail and of the traffic upon our rivers. To do this is not to mark an object but to record a movement or an event.

### Scenic

Iowa has no mountains to which proud reference may be made; and at no time has the attention of the present investigators been called to a possible Castle Rock or Lover's Leap. With the exception of the rougher lands in the northeastern part of the state and the loess hills of the western counties, Iowa's landscape ranges from the rolling prairies of the Northwest to the

eroded brush-covered valleys of the southeast. Yet the lands of Iowa, the lakes and streams, the cities and towns, have a potential beauty that is quite in keeping with the even tenor of the lives of the people.

Already portions of those occasional areas that have unusual scenic value are being acquired as state parks. A gradual appreciation of the wind blown hills of our western counties is indicated, and there is an increasing interest in the preservation and enjoyment of our streams and lakes as scenic assets. With the exception of the destruction of the woods that clothe our scenic areas and much overgrazing of woodland pasture, no changed usage contributes to their deterioration. Indeed, with a changed economic condition, there is often a return of marginal lands to their more natural conditions and a reversion of straightened streams to their original meandering.

This committee has secured and compiled data relative to areas that have not only scenic value but also recreational value by reason of the sense of freedom and the intimate contact with nature that they afford. It has given consideration to the establishment of such wayside areas as may give the traveler an opportunity to rest and to enjoy the gracious shade of trees, or to enjoy some striking view ahead. It is giving consideration to the problems relating to small park areas that will give a local service only, endeavoring to define a policy that will satisfactorily provide for their establishment and maintenance; and finally, it has maintained a keen interest in those large recreational areas that are needed in a state that is so completely given over to private ownership.

It is regrettable that in Iowa so few individuals organizations or

insitutions have realized the importance of stressing the esthetic values in the planning of our farms, our homes and our towns. This may come when we realize that this is not our temporary but our permanent home. Someone has said: "We have been in America 300 years and it is high time we acted as though we expected to be here 300 more."

#### OBJECTIVES

It has been the purpose of this project to collect and assemble all available information on the historic and scenic resources of the state, with a view toward preservation and restoration and proper use by the people. Also included has been the duty of supervising certain unskilled work in excavating ancient village sites and Indian mounds now threatened with destruction.

Specifically, the present survey may be regarded as having the following objectives:

1. To gather information relative to historic and scenic values.
2. To propose a program for the preservation and restoration of historic resources. This includes the purchase of land for the restoration of ancient villages and Indian cemeteries.
3. To propose a program for the preservation and development of scenic resources. This includes the making of provisions for recreational facilities.

#### PROCEDURE

Project 1047 has been conducted in two sections. One of these, herein designated as Archeological, has been concerned chiefly with the assembling of data pertaining to Iowa's early historic and prehistoric inhabitants

before such data become entirely lost or at least rendered very difficult and expensive of acquisition.

The other section has been concerned mainly with the surveying of sites of historic and scenic value, in keeping with the growing interest--throughout many of the states of the Union--in the location, preservation and marking of such sites.

#### Archeological

Of the thousands of Indian mounds formerly standing on Iowa soil, only a few hundred remain undisturbed at this time, the majority having been defaced or obliterated by farming operations or dug into by curiosity seekers and the contents destroyed or carried off without any attempt to preserve factual data or make interpretations. The same fate has befallen the old Indian burial grounds to a very large extent. The village sites have fared somewhat better, as a considerable portion of those lie below the plow line, and moreover they make no such appeal to the collector of curiosities as do the mounds. Even here, however, it is desirable to preserve all available data before erosion of the soil or the slow disintegration of much of the archeological material causes real loss of the facts that go to build history.

The valley of the Upper Iowa River was chosen as the area of exploration for the summer of 1934 for two reasons: (1) the region was known to possess a rich and complex archeology, and (2) it was possible to use in this area the great experience in and knowledge of the region possessed by a resident of Waukon who had studied and collected in the area for more than fifty years. This man's labors had raised, but not solved,

numerous important problems. The solution called for extensive excavation.

Two men did the finishing work in the excavation, such as the uncovering of burials or objects in the site, and attended to necessary surveys, photographing, and the recording of data, while a third directed the gross excavations and observed both the vertical and horizontal cross sections for any signs that called for a slowing up of work with the shovels.

#### Historic and Scenic

Because of the interest of the Iowa State Historical Society in the proposed survey of historic sites, and because of the historical data which it had already compiled, arrangements were made whereby both the society and the planning board might cooperate.

The survey, made by representatives of the two organizations, was begun at Iowa City on August 13, 1934. The route extended through most of Iowa's 99 counties, returning to Iowa City at the end of the third week.

During the progress of the survey the men took pictures of sites of interest, held conferences with interested citizens, and kept a record of their findings.

#### ACCOMPLISHMENTS

##### Archeological

Field work began on the New Galena mound group, situated on a high terrace of the Upper Iowa, a half mile west of the New Galena Bridge. This group consisted originally of thirty-two mounds of the conical type. After fifty years of cultivation, only half of the original number of

mounds still show an elevation above the natural surface of the terrace, although they are still available for scientific study. Excavations were carried on from June 11 to June 21, during which period five mounds of the group were thoroughly explored and, after completion of the work, refilled, the two operations calling for removal by means of hand shovels of about eight hundred cubic yards of earth. Secondary burials in pits below the mounds, along with potsherds and other artifacts of Algonkian type, proved conclusively that the mounds were made by people of the Algonkian stock. At the same time collections of village refuse made on the surface of the mounds and terrace, and also the finding of a primary intrusive burial in the top of one of the mounds, this burial being accompanied by a pottery vessel and flint artifacts of Siouan types, also proved that a Siouan people occupied the New Galena terrace at the time subsequent to the building of the mounds. This stratification was clearly indicated and a time sequence thus established for two of the Indian stocks known to have occupied Iowa in prehistoric times. This culture stratification is the first one to be definitely established in Iowa and is also one of the few thus far definitely known for the upper Mississippi Valley.

On June 22, work was begun on a terrace of the Upper Iowa, situated on the north bank of the stream three miles below the New Galena site, and continued until expiration of the first period of work on June 29. This terrace, known locally as the O'Regan, is the site of an old Indian village, not mentioned by history but clearly indicated by the large



number of fireplace stones, potsherds, and flint refuse scattered over its twenty acres of surface. Excavation of about four hundred and fifty cubic yards of earth, a considerable amount of which was put through sieves, resulted in the discovery of eighteen burials of primary type and the recovery of a sufficient amount of pottery, and of chipped flint, ground stone and other artifacts to determine clearly the Siouan origin of both village and cemetery. Moreover, the finding of a small number of glass beads and brass ear ornaments in connection with the burials showed that the village must have been occupied until the early period of white contact. It is believed that these finds will make possible fairly close approximation to the date of occupancy of the village and perhaps lead to the identification of the inhabitants themselves. In addition to all objects of handiwork found, a considerable collection of skeletal materials was preserved. Much of this was beyond preservation, but it is believed that a reasonably adequate series for laboratory study is in hand.

#### Historic and Scenic

The survey of historic and scenic sites at the end of the third week had led through 65 counties and had touched more than a hundred points of historic significance.

Included among the places of interest reached during the progress of the survey were some in or near the following cities and towns:

1. Manchester - Old stage tavern and site of the first creamery in the United States.

2. Dubuque - Locus of the first permanent settlement in the Iowa country.

3. Sioux City - Monument in honor of Sergeant Charles Floyd, a member of the Lewis and Clark Expedition in 1804.

4. Salem - Underground railway station.

5. Corning - Site of an Icarian settlement.

6. Talmage - Site of a Mormon camp.

7. Agency - Graves of Joseph M. Street and Chief Wapello.

8. Floris - Old log church, probably a unique example for Iowa.

9. Muscatine - Once the home of Samuel Clemens (Mark Twain).

10. Davenport - Once the home of Antoine Le Claire.

11. Le Claire - Boyhood home of William F. Cody (Buffalo Bill).

12. Springdale - Site of the John Brown House.

Everywhere along the way people seemed cordial and interested in the survey. Not infrequently the surveyors, upon their arrival in a city, found that their coming had been anticipated and that comments favorable to the work had already appeared in the newspapers.

Through the cooperation of the many county historic societies, public spirited citizens, and local groups 202 areas of historic significance have been tabulated. From this list the Superintendent of the State Historical Society and his staff have selected 78 which are of outstanding importance in the history of Iowa. Sixty of these have been investigated in the field. To date, two areas have been recommended for acquisition, restoration, and preservation. These are the "John Brown House" near Springdale in Cedar County (see Pictures 1047-A), and the

"Galland School" in Lee County--the first schoolhouse built in the state. An FERA project is being proposed for the restoration of the first of these structures.

Data have been obtained for 239 outstanding areas of scenic beauty and scientific interest located in 92 counties. Two-thirds of these areas have received field examination and will be classified for future use.

The committee having been urged to an interest in roadside parks, the matter was taken up with the Iowa State Highway Commission. The commission indicated a definite interest in and a willingness to maintain adjacent to highways small parks (about one acre or so in area) which would permit travelers to rest and enjoy some slight recreational opportunities.

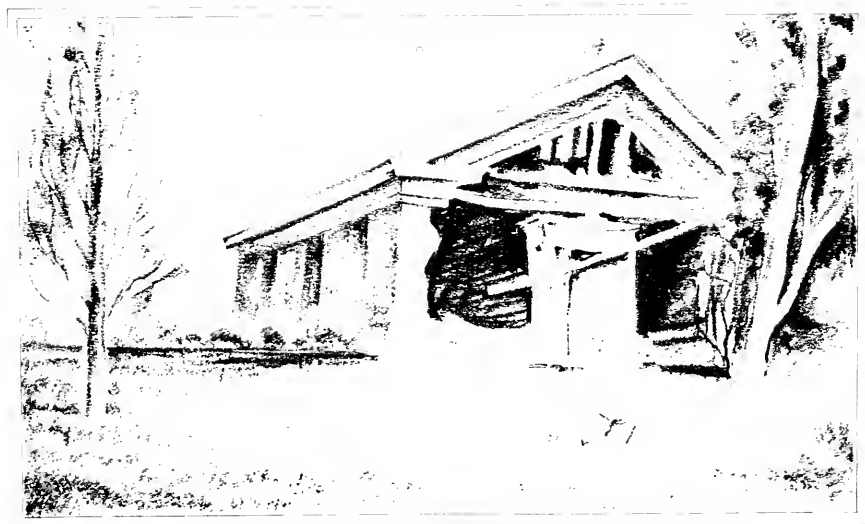
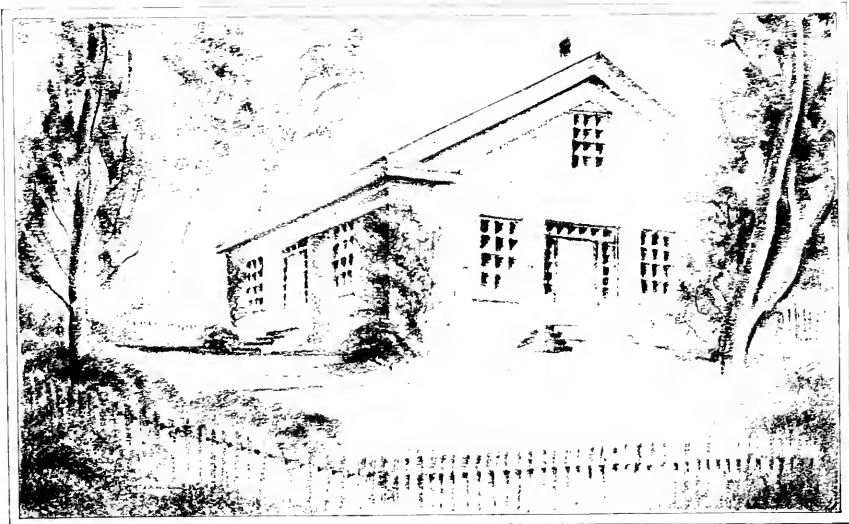
In the matter of somewhat larger parks of perhaps 25 acres which would serve a local usage, consideration is being given to establishing a policy predicated upon their creation and maintenance in a satisfactory manner. After the determination of such a policy an effort will be made to stimulate local interest in such recreational areas. As described in the report of the Zoning and Planning Committee, Project 1042, some twenty wayside parks have been tentatively located and discussed. Of these, two have been agreed upon by the State Board of Conservation.

While such park developments would conduce scenic improvement in no small measure, they are more fully treated in the present report in connection with zoning and planning; for they properly come within the field of regional planning.

THE JOHN BROWN HOUSE

Picture 1047-A

The upper picture suggests a possible restoration of the John Brown House, in Cedar County, while the lower depicts the present dilapidated condition of this historic monument. The architecturally commendable features of the structure are now hidden behind a farm house. Acquisition, removal and restoration are recommended; provision for the necessary work is included in a recently proposed FERA project.





## RECOMMENDATIONS

### Archeological

It is recommended by the supervisor that excavations in Allamakee County be continued for a part or all of September, 1934, and that collecting data on the most important Indian antiquities remaining in other parts of Iowa be undertaken after the cessation of work in that county.

### Historic and Scenic

It is recommended that, in the acquisition by the state of properties to be preserved as historic sites, special consideration be given to: (1) the stone house west of Winterset--perhaps the most typical, best preserved and most accessible underground railway station now existing in Iowa; (2) the home of the first governor of the State of Iowa, Ansel Briggs, near the town of Andrew; and (3) the old mills at Decorah, Bellevue and Motor.

It is further recommended that uniform highway markers be placed near all points of historic interest on the main highways of the state.

## FUTURE WORK

Future work of the committee on Historic and Scenic areas will be: the classification of the sites according to types and significance; the formation of plans for state-wide acquisition, development and preservation of historic sites; the designation of historic sites to be maintained by local agencies; and the cooperation with other planning agencies in the development of a broad recreational policy which will include as parks, preserves or sanctuaries these choice scenic areas.

SURVEYS, MAPS AND PLANS

Project 1050

PLANNING BOARD COMMITTEE

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P. F. Hopkins, Chief Engineer of P. W. A., Des Moines  
George Keller, Chief Engineer of F. E. R. A., Des Moines

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PROJECT SUPERVISORS

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J. R. Fitzsimmons, Landscape Architect, I. S. C., Ames

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TECHNICAL ADVISERS

P. E. Brown, Farm Crops and Soils Department, I. S. C., Ames  
J. S. Dodds, Professor Civil Engineering, I. S. C., Ames



## SURVEYS, MAPS AND PLANS

The work of the Committee on Surveys, Maps and Plans is not always easy to distinguish, since it is so closely related to that of other committees. It consists chiefly of the graphic rendering and presentation of the facts and data of the other projects.

More than 550 base township maps have been drafted under the supervision of the committee in completing work started under C.W.A. last winter. A complete, uniform set of these township maps for all surveyed townships is now available, a total of 1632. (See Figure 1050-1) This is the first set of its kind ever to be assembled, and represents labor totaling 11,444 man-hours. Of this total, 5,673 man-hours were contributed by the Planning Board.

Included among the data of these maps are all cultural and drainage features for each township--cities, railroads, primary county and secondary roads, dwelling houses, churches, schools, streams, lakes, ponds, ditches, and intermittent streams. These are at present being used by the Forests and Wastelands survey parties, and by the Fish and Game Commission for the recording of field data.

Since the latter part of March the committee on Surveys, Maps and Plans has maintained a complete drafting service for the coordinators and field men of the various committees to facilitate the compilation of preliminary reports and to prepare the necessary graphs and plans.

The draftsmen have prepared more than 100 large base maps which present

## TOPOGRAPHIC RELIEF MAP

Fig. 1050-1

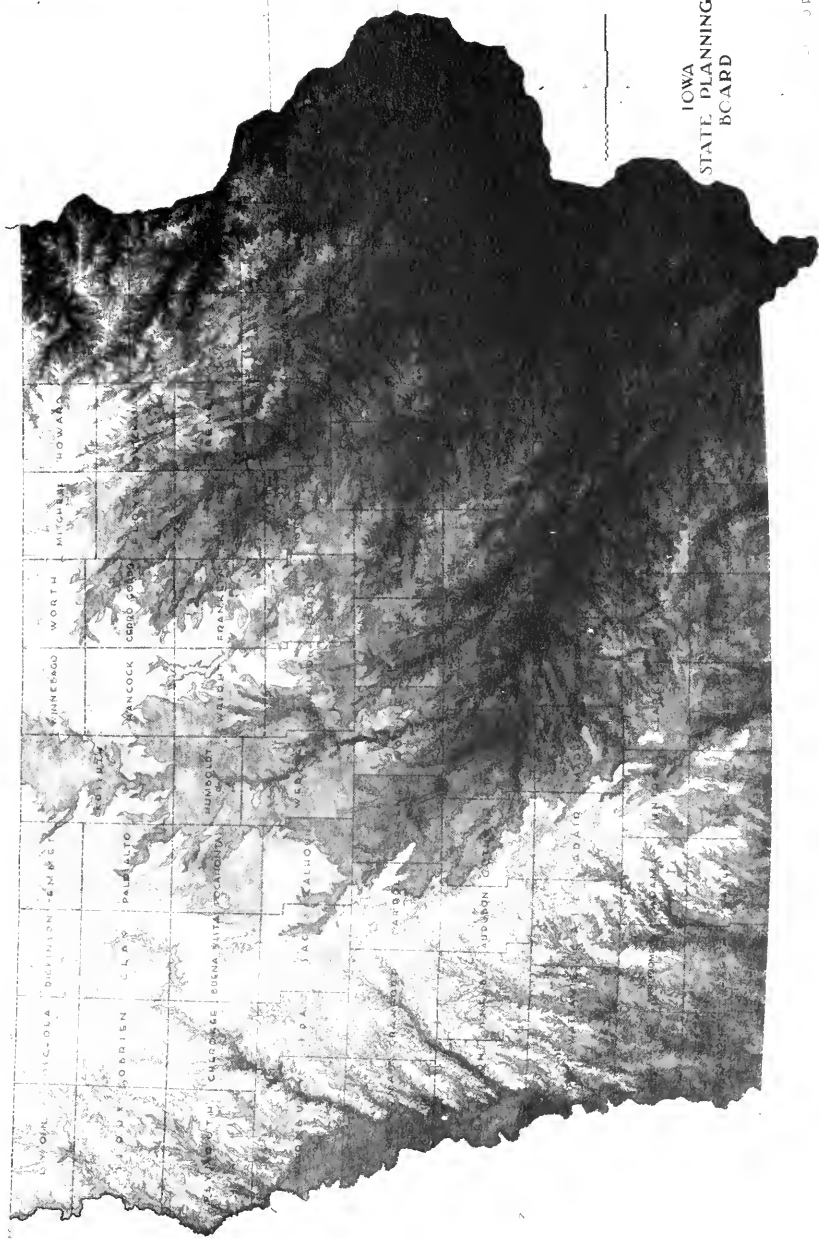
The accompanying map is a sample copy of one of the township base maps prepared for all of the civil townships in Iowa. These are drawn at the scale of two inches to a mile on 17 x 22 inch sheets, totaling 1632 in number.

The different cultural and drainage features which are shown on the maps, are given on the sample copy of one of the title sheets for the township maps of a county. An index map of the county and the sources of map information, used in the preparation, are also given on the title pages.

Copies of these maps are distributed at the cost of printing by the Iowa Agricultural Experiment Station in loose sheets or in bound folios for each county. The folios, which include the title pages, are bound in durable flexible covers.

IOWA STATE PLAN

• TOPOGRAPHIC RELIEF MAP •



IOWA  
STATE PLANNING  
BOARD

1950

1050-1



in a graphic form the more important data, together with 150 smaller charts and diagrams. The titles, illustrations and cover for this preliminary report are also included in the creative work of the drafting force.

The number of persons employed in the drafting room has varied from two to 17. In all, a total of 825 man days has been used in the preparation and supervision of the maps and plans.

TABLE 1050-A

DRAFTING TIME BY PROJECTS\*

Project :	Days	Project :	Days
1030	126	1042	41
1031	50	1043	19
1032	3	1044	33
1033	53	1045	5
1034	7	1046	2
1035	62	1047	--
1036	50	1048	131
1037	7	1049	--
1038	--	1050	33
1039	22	1051	17
1040	5	1052	8
1041	--	1053	7
<hr/>			
Base Maps and General--148 Days			

\*Data as of September 8, 1934

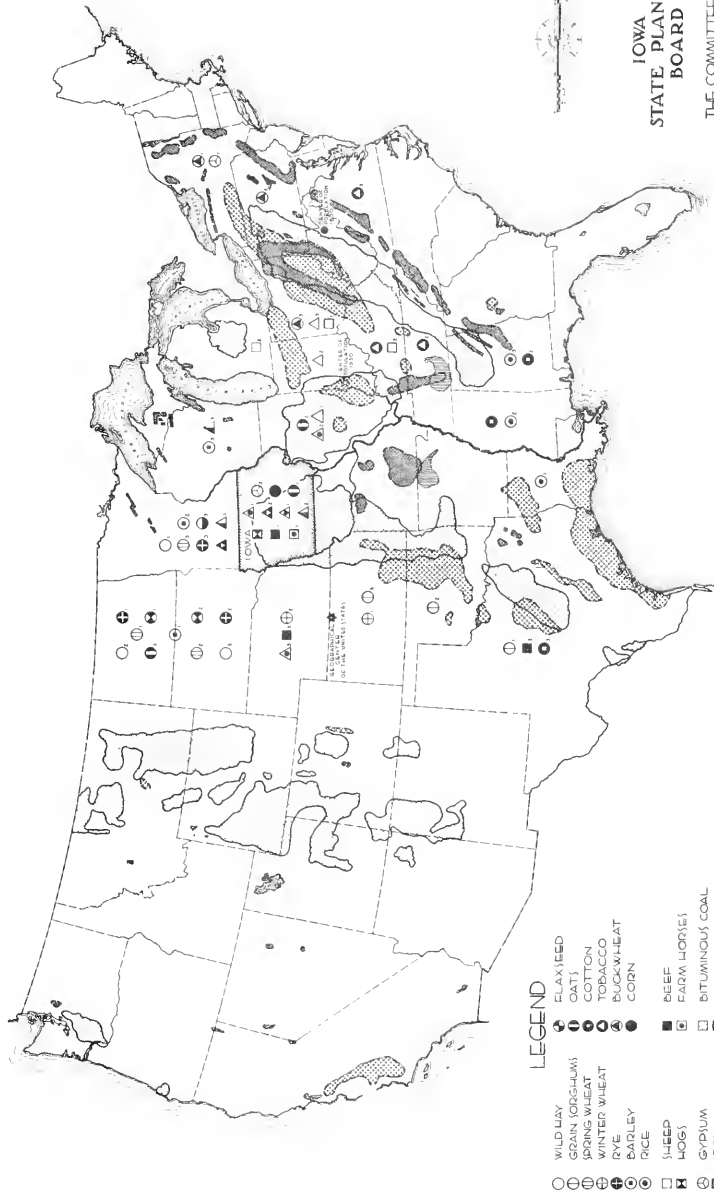
# GEOGRAPHICAL ADVANTAGES

Fig. 1050-2

This map shows the geographical advantages of Iowa, as compared to the United States as a whole. The small numbers indicate the rank of the state in the specific criteria. They indicate Iowa's supremacy in use of agricultural machinery, the manufacture of agricultural wastes and farm value of crops, livestock, and livestock products. Iowa is first in the production of corn, oats, beef and hogs.

# IOWA STATE PLAN

# GEOGRAPHICAL ADVANTAGES



## LEGEND

- |   |                                       |   |                 |
|---|---------------------------------------|---|-----------------|
| ○ | WILD LUX                              | △ | FLAX/FEED       |
| ○ | GRAN (GOLDS)                          | ○ | OATS            |
| ○ | SPRING WHEAT                          | ○ | COTTON          |
| ○ | WINTER WHEAT                          | ○ | TOBACCO         |
| ○ | RYE                                   | ○ | BUCK-WHEAT      |
| ○ | BARLEY                                | ○ | CORN            |
| ○ | RICE                                  | ○ | BEER            |
| ○ | SHEEP                                 | ○ | FARM HORSES     |
| ○ | HOGS                                  | ○ | BITUMINOUS COAL |
| ○ | GYPSUM                                | ○ | ANTHRACITE COAL |
| ○ | IRON                                  | ○ | PHOSPHATE ROCK  |
| ○ | OIL                                   |   |                 |
| △ | BUTTER FAT                            |   |                 |
| △ | BUTTER                                |   |                 |
| △ | AGRICULTURAL MACHINERY CONSUMPTION    |   |                 |
| △ | MANUFACTURING FROM AGRICULTURAL WASTE |   |                 |
| △ | AGRICULTURAL EQUIPMENT MANUFACTURING  |   |                 |

NOTE: SMALL NUMBERS BEHIND SYMBOLS INDICATE PERCENTAGE OF TOTAL PRODUCT MANUFACTURED IN THE RESPECTIVE COUNTY.

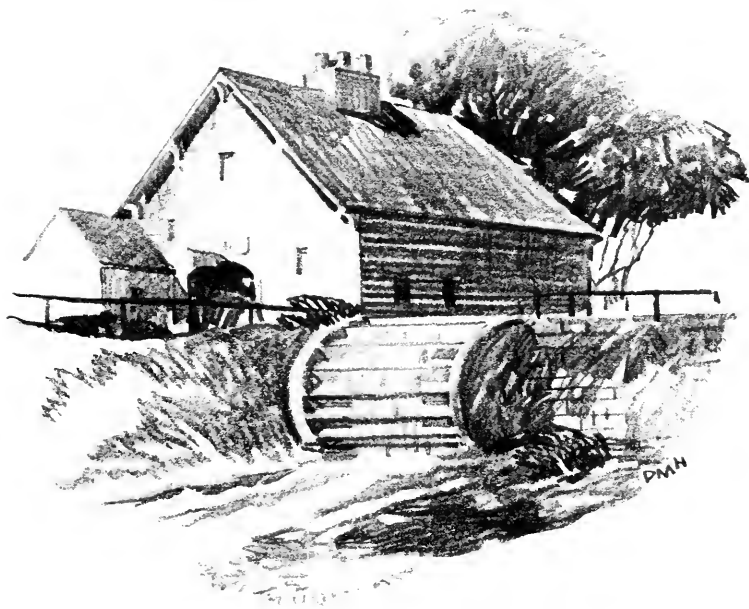
IOWA  
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BOARD

THE COMMITTEE ON  
SURVEYS, MAPS & PLANS  
PROJECT 1050

1050-2







WATER

WATER FLOW AND SUPPLY, AND STREAM POLLUTION

Project 1044 - 1045 - 1046

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WELL CORE CHARACTERISTICS 1044-C  
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PRECIPITATION AND FLOOD CONTROL 1044-D  
F. T. Mavis, Institute of Hydraulic Research, S. U. I., Iowa City

SURVEY OF MEANDERING STREAMS AND LAKES 1045  
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STREAM GAUGING STATIONS 1046  
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## WATER RESOURCES OF THE STATE OF IOWA

The purpose of this report is to present the results of a relatively short period of investigation and study of the different phases of the water resources of Iowa. These results are in the form of data, information, and opinion from the various State Planning Board project supervisors and technical advisors in charge of each division who have compiled their reports not only from present investigations, but also from the works of other authorities treating the subject in the past. It must be realized that, in large measure, these findings are preliminary in nature because of numerous factors, such as the absence of available records over long periods and the incompleteness of data now in stage of accumulation. Where it is impossible to present even preliminary findings the purpose and progress of the study will be presented. The ramifications of the subject are numerous and complex and certain parts have only recently been subjected to close scrutiny. It is not possible here to delve into all phases of such a wide field and this report will concern itself chiefly with seven major divisions or projects now in active operation by the Iowa State Planning Board:

1. Natural conditions and general supply. Project 1044.
2. Geological data on well cuttings. Sub-Project 1044-C.
3. Water analysis. Sub-Project 1044-B.
4. Climatology and precipitation and flood control. Sub-Project 1044-D.
5. Stream measurements. Project 1046.
6. Public water supply and waste disposal. Sub-Project 1044-A.
7. Meandered stream surveys. Project 1045.

Other phases which will be discussed briefly will include water power, drainage and irrigation, navigation and recreation. In addition, there is incorporated a "Preliminary Report of Committee on Lower Des Moines River Valley" under Project 1054 which deals directly with a particular locality of the state.

Water is a natural resource and mankind is dependent upon it. "The quantity of water with which mankind is concerned must always remain substantially the same, but its occurrence and its distribution over the surface of the earth is continually changing."\* Since we no longer lead a nomadic existence we must concern ourselves with the problem and, first of all, we must study the physical features of the region.

#### GENERAL PHYSIOGRAPHY

Iowa as a whole is a prairie state in the Mississippi valley lying between the Mississippi River on the east and the Missouri River on the west. Its relief is moderate and its slopes gentle with a high point of 1675 feet above sea level in the northwestern part of the state and a low point of 477 feet above the same level in the southeastern corner. The main drainage basins closely follow a similar line from northwest to southeast and approximately two-thirds of the state drains to the Mississippi River. (Figure 1044-1)

Due to the widespread use of both shallow and deep wells as a source of water supply, the physiography and the geology of the state demand primary attention. The more important geological factors that determine, at

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\* Meyer, Adolph F., "Elements of Hydrology"

least in part, the quantity and distribution of underground and surface waters in Iowa are (1) the rock formations of different ages and types, (2) the distribution of the outcrops of these formations, (3) their structure, (4) the glacial and interglacial drift sheets of different ages, (5) the different degrees to which these different drift sheets have been eroded by streams, and (6) the loess which is widely distributed within the state.

Physiographic history is largely responsible for surface waters, including the rivers and smaller streams, springs, lakes, and swamps. In Iowa the more important factors are the repeated advances and retreats of depositing glaciers and the erosion by streams of the resulting drift sheets. Both the running and the standing water are supplied either from direct runoff or precipitated moisture or from ground water where the voids are temporarily or permanently over-full and discharging at the surface.

#### SOIL AND ROCK CHARACTERISTICS

Approximately three-fourths of the surface of the state is covered by a discontinuous sheet of wind deposited loess. Its thickness varies greatly within short distances. This material is intermediate between sand and clay in porosity. This loess exerts considerable influence on both the surface water and the shallow ground water supplies.

Application of basic geologic principles to the facts shown in the following table and three figures affords a general geologic background for the water planning within the state. Table 1044-A shows the stratigraphic positions and the characters of both the hard rock and mantle rock formations of the state; Figure 1044-3, the distribution of outcrops of the older hard

DRAINAGE BASINS

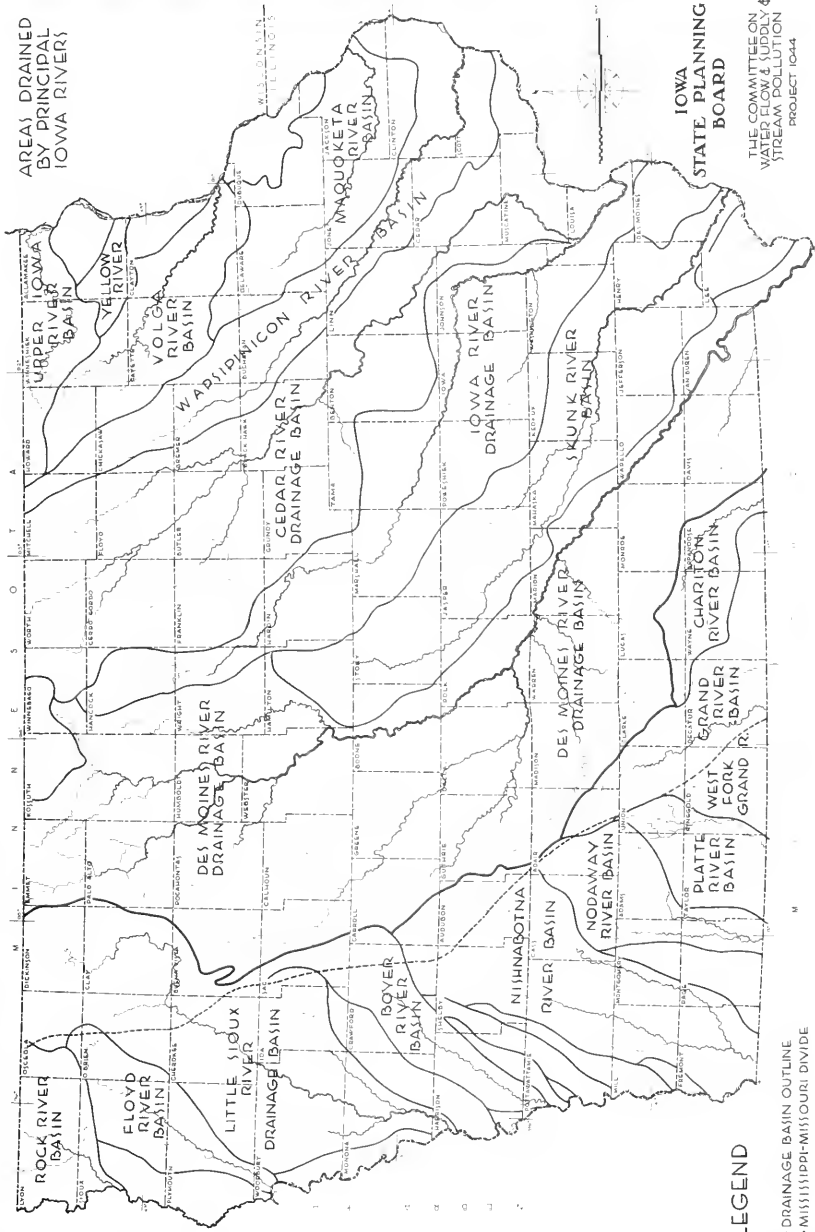
Fig. 1044-1

The divide between the Mississippi and Missouri basins lies along a rough arc crossing the north and south borders of the state so that the west one-third of the north part of the state and the west two-thirds of the south part are drained to the Missouri. The divide does not everywhere coincide with the highest area of the state; the divergence between them is indicated on the accompanying map.

# IOWA STATE PLAN

# DRAINAGE BASINS

AREAS DRAINED  
BY PRINCIPAL  
IOWA RIVERS



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STREAM POLLUTION  
PROJECT 1044

## LEGEND

- DRAINAGE BASIN OUTLINE
- MISSISSIPPI-MISSOURI DIVIDE
- HIGH LAND DIVISION LINE

1044-1





rock formations; Figure 1044-4, the general structure of the pre-cretaceous rock formations as represented by the top of the St. Peter sandstone; and Figure 1034-2, the surface distribution of the five drift sheets and the associated loess.

Although almost any one of the hard rock formations may yield water from deep wells in some part of the state, the better aquifers are the sandstones, such as the Jordan, St. Peter, and Dakota formations. Some of the limestones in certain places are so jointed and dissolved as to have large void spaces providing large water supplies, but this water is likely to be hard and otherwise mineralized. The Galena and Prairie du Chien formations yield highly mineralized water in some localities. Any given aquifer lies deeper in the southwestern than in the northeastern part of the state. Because the better aquifers lie so deep in southwestern Iowa and so much of the water within economical reach is heavily mineralized, the people of this section have, of necessity, depended upon surface reservoirs or shallow wells for municipal and domestic water supplies.

The Nebraskan and to a smaller degree the Kansan drift of northeastern Iowa have been so eroded as to render this area essentially driftless. It is in a mature stage of erosion and is well drained by four rivers. Artesian wells produce from the Jordan, Galesville, or Mt. Simon sandstones, and common wells produce from outcropping sandstone and limestone formations. Soil erosion is taking place here at a rapid rate.

The Nebraskan and Kansan drift sheets of southern and western Iowa have also been eroded to maturity, but there remains here an almost continuous cover of drift and deposits of loess of considerable thickness. The larger

GEOLOGIC MAP

Fig. 1044-3

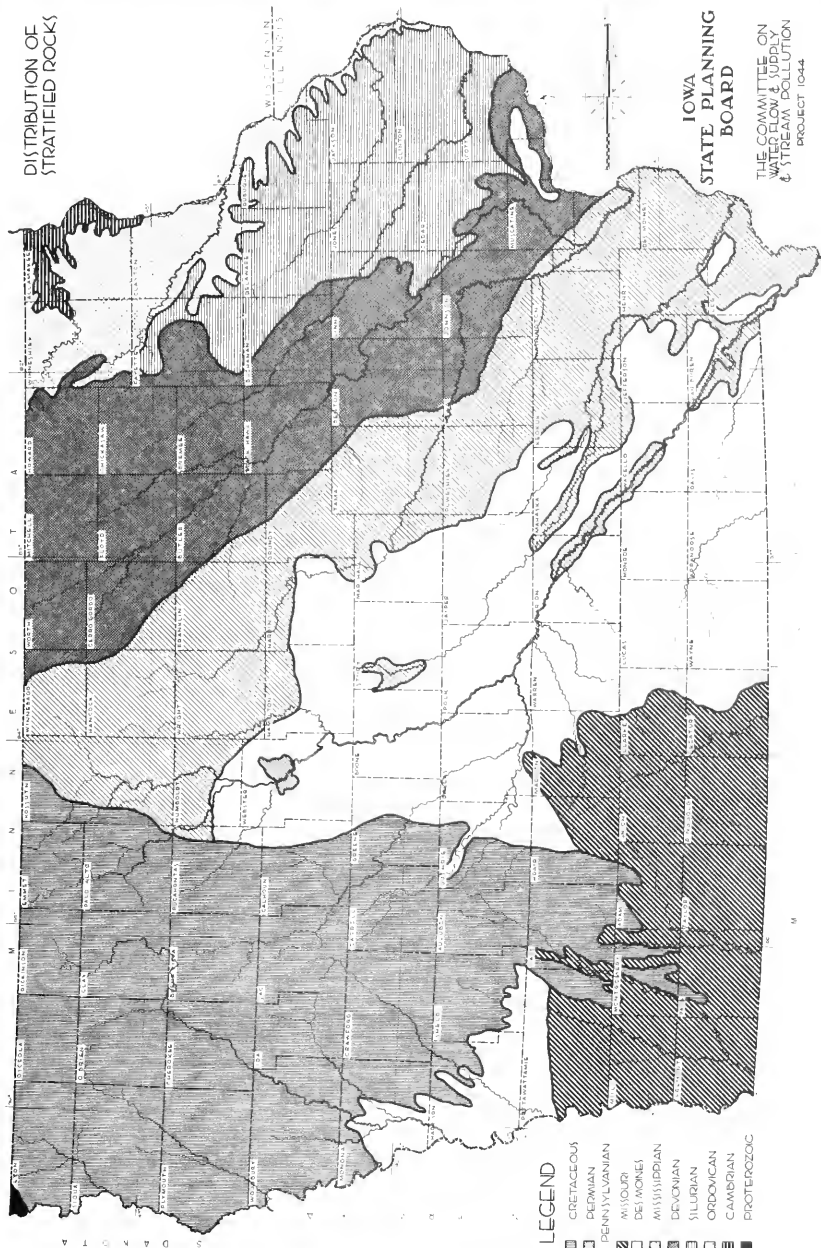
The areas of outcrop of the several hard rock systems and series are shown on the geological map of Iowa. The older formations are at the surface in the northeastern part of the state and dip gently southwestward. Water enters the porous layers at their outcrops and migrates to the southwest to accumulate and develop head. The Cretaceous rocks, including the Dakota sandstone, derive their water chiefly from the northwest.

# IOWA STATE PLAN

# GEOLOGICAL MAP

# MAP

DISTRIBUTION OF  
STRATIFIED ROCKS



## LEGEND

- CRETACEOUS
- DELMAN
- PENNSYLVANIAN
- MISSOURI
- DE MOINES
- MISSISSIPPIAN
- DEVONIAN
- SILURIAN
- ORDOVICAN
- CAMBRIAN
- PROTEROZOIC

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& STREAM POLLUTION  
PROJECT 1044

1044-3



rivers of this area together with numerous tributaries to the Missouri would provide considerable power, if harnessed, but the discharge fluctuates greatly. Numerous common wells find water in the drift. In this area, soil erosion is also a serious problem.

The Iowa and the Wisconsin drift are so young as not to have been eroded much, and glacial topography still prevails where these drift sheets appear at the surface in central and north central Iowa. This is an area of flat or gently rolling topography and lakes and swamps are not uncommon. Rivers are unimportant and have relatively low slopes and the soil erosion is less serious than elsewhere. Agricultural tiling is frequent in this portion of the state. The recreational facilities of the state are in most part concentrated around the lakes in the northern part of the area of Wisconsin drift.

#### GENERAL SUPPLY

In closing with the general geology of the state we find ourselves confronted with a specific geologic problem, that of a study of deep wells. In the past, water has been taken for granted and we have assumed that the quantity and the quality were adequate. The unprecedented drouth of 1934 has brought unpleasantly to our attention the fact that supplies can be exhausted and that the location and the production of an adequate water supply often is essentially a geological problem.

The sub-surface water resources of Iowa can be classed as one of the most important of the assets of the state. Approximately 400 deep wells supply water for municipal or private uses in the state. General records

Table 1044-A

System	Subdivision	Character
Recent		Soil, alluvium
Pleistocene	Wisconsin Peorian	Boulder clay Loess, forest bed, sand, gravel
	Iowan Sangamon	Boulder clay Gumbotil, soils, forest bed, sand, gravel
	Illinoian Yarmouth	Boulder clay Gumbotil, peat, soil, sand, gravel
	Kansan Aftonian	Boulder clay, gravel, Gumbotil, peat, soil, gravel
	Nebraskan	Boulder clay, gravel
Tertiary	Windrow	Gravel, conglomerate, iron
Cretaceous	Colorado	Shale, limestone
	Dakota	Sandstone
Permian	Fort Dodge	Gypsum, shale
Pennsylvanian	Missouri	Limestone, shale, coal
	Des Moines	Shale, coal, sandstone, limestone
Mississippian	Meramec	Limestones, marls, sandstones
	Osage	Limestones
	Kinderhook	Shale, limestones
Devonian	Sheffield	Shale
	Lime Creek	Shale, limestone
	Shell Rock	Limestone, shale
	Cedar Valley	Limestone
	Wapsipinicon	Limestone, shale

Table 1044-A Cont.

System	Subdivision	Character	
Silurian	Salina	Limestone, gypsum	
	Gower Hopkinton	Magnesium limestone	
	Maquoketa	Shale, limestone	
Ordovician	Galena	Magnesian limestone	
	Decorah	Shale, limestone	
	Platteville	Limestone	
	St. Peter	Sandstone	
	Prairie du Chien	Shakopee New Richmond Oneota	Magnesian limestone Sandstone Magnesian limestone
	Jordan	Sandstone	
	St. Lawrence	Limestone, shale	
Cambrian	Franconia	Sandstone, shale, limestone	
	Dresbach	Galesville Eau Claire Mt. Simon	Sandstone Sandstone, shale Coarse sandstone
	Red Clastics	Sandstone, shale	
Huronian	Sioux	Quartzite	
Archean		Granite, schist	

The hard rock and mantle rock formations that occur at and beneath the surface of Iowa are listed according to position in the geologic column. The Mt. Simon, Galesville, Jordan, St. Peter and Dakota sandstones are major sources of water from deep wells. Water from limestone and shale and from deep-lying sandstone is likely to be badly mineralized.

TOP OF ST. PETER SANDSTONE

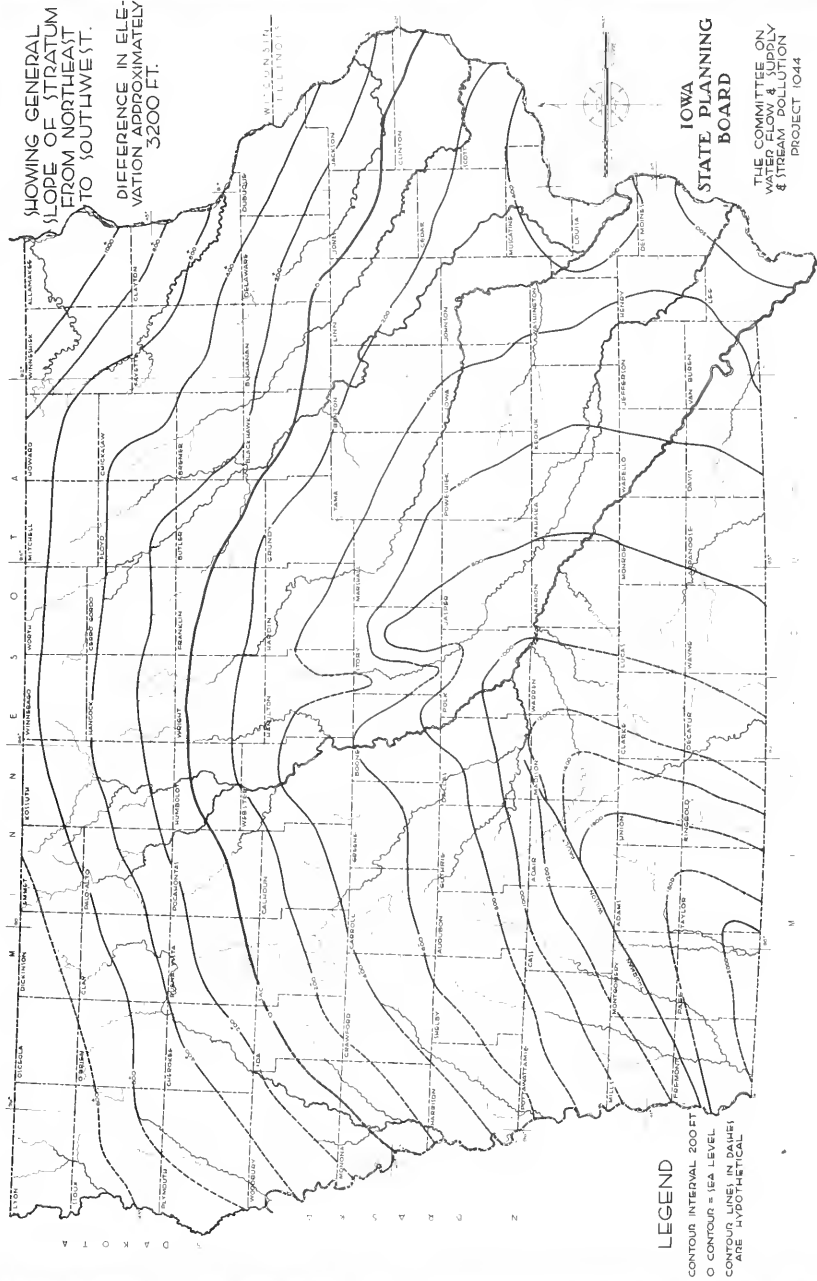
Fig. 1044-4

The contour lines indicate the position above or below sea level at which the top of the St. Peter sandstone is struck as wells are drilled. This aquifer which is at the surface at an elevation of 1000 feet or more above sea level in Allamakee County is 2000 feet below sea level and more than 3000 feet beneath the surface in Fremont County.



# IOWA STATE PLAN

# TOP OF ST. PETER SANDSTONE



1044-4



of the geology of most of these have been recorded. In fact, for over 40 years the Iowa Geological Survey has been accumulating data and publishing the results of its study of the deep wells of Iowa. Careful analyses of water during the past few years by the State Board of Health prove the value of this geologic study. These analyses show that much of the deep well water is mineralized. Some water is so highly mineralized that it is unfit for domestic use. Some water contains compounds that are actually injurious to health, other water may be mineralized but fit for domestic use and for many other purposes.

WELL CORE CHARACTERISTICS  
Sub-Project 1044-C

It is well known that the mineral content of deep well water is related to the type or kind of rock with which it is associated and that the solid minerals of the rock provide the dissolved minerals of the water. The purpose of this particular investigation shall be to serve the citizens of the State by learning what water is available and what water is impure or unhealthful. A specific example of the need for this study is found in the case of fluorine which is known to occur in water of various localities of the State. Until this project was started the source of fluorine was unknown, but its injurious character made it necessary that the origin and distribution in the rocks be studied. Most of the undesirable constituents of water occur in very small quantities and it would be expected that the minerals of the rock supplying these elements would also be of minute amount.

# EROSION BY SOIL AREAS

Fig. 1034-2

The surface distribution of the five glacial drift sheets is shown. The oldest or Nebraskan drift has been so eroded and buried as to have relatively small surface distribution. The Kansan drift has been eroded to maturity and covered partly by loess, and there are practically no natural lakes in its area of outcrop. The surface is too well drained and too rough for ideal agricultural conditions. The younger Iowan and Wisconsin drift sheets, however, are almost uneroded and the loess covering is thin or lacking. The north-central portion of the state, therefore, contains numerous lakes and swamps.

# IOWA STATE PLAN

# EROSION BY SOIL AREAS

RELATIVE OCCURRENCE OF  
EROSION IN VARIOUS SOIL  
AREAS OF IOWA

## LEGEND

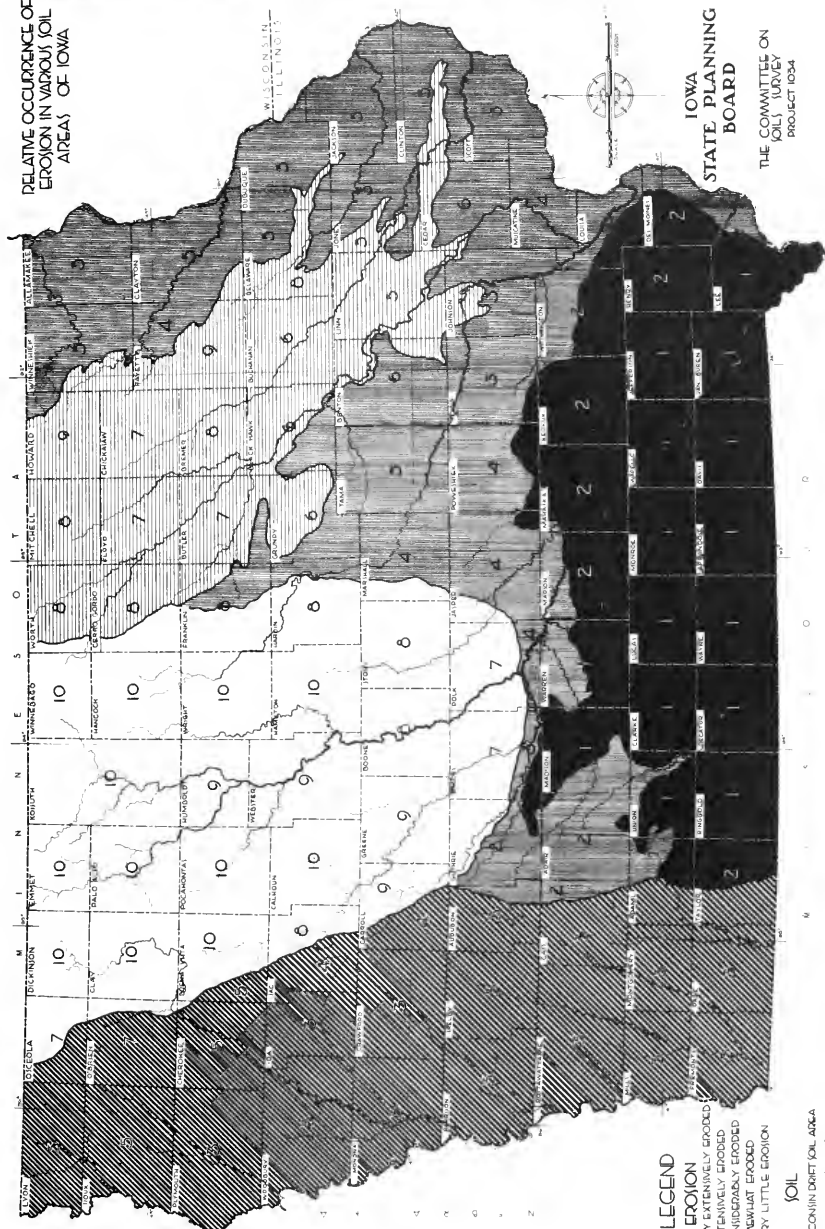
- EROSION**
- 1-2 VERY EXTENSIVELY ERODED
  - 3 EXTENSIVELY ERODED
  - 4-5-6 CONSIDERABLY ERODED
  - 7-8-9 MODERATELY ERODED
  - 10 VERY LITTLE EROSION

## SOIL

- WISCONSIN DIRT SOIL AREA
- IOWAN DIRT SOIL AREA
- MISSISSIPPI LOESS SOIL AREA
- MISSOURI LOESS SOIL AREA
- SOUTHERN IOWA LOESS AREA

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SOIL EROSION  
PROJECT 1034

1034-2





To say that water of a known composition is being produced from a limestone or from a sandstone, or even to say that it comes from a Mississippian limestone so many feet below the surface, is insufficient for the determination or solution of this problem. Instead it is necessary to know in complete detail the exact character of the rock and to know to even the most minute quantities what minerals occur in the rock. To obtain this information it was necessary to establish a rather complicated procedure of examination. The data that are being collected and the maps which will show the distribution, elevation, and thickness of each water-producing formation, are entirely new and will provide information that has never before been available in any form.

Results already have been realized from this work but the value of the program as a whole is dependent upon its continuance. To the date of this writing, September 1st, 1934, 33 wells distributed uniformly over the state have been accurately described for major characteristics through the use of binocular microscopes. The mineralogies of the Ankeny and Nevada wells have been completed, and certain formational units have been completed for other wells. The presence of mineral fluorite is well established at both Ankeny and Nevada. At Ankeny it is confined to certain zones of the Mississippian system, while at Nevada it is found in certain definite beds of the Mississippian, Devonian, Silurian, and Ordovician rocks. At present mineralogical studies are being conducted to determine the distribution of fluorite in the Mississippian rocks of the state.

That the work should continue is obvious. Certainly the same information that has been obtained from the two completed wells should be procured from a number of wells uniformly distributed throughout the State. A close comparison is being made in all cases with the analysis of water from the wells being studied, the source of this water, and the nature and composition of the rock.

Since the working program is but half completed it is too early to make direct application of the study to public works. Certain suggestions, however, appear as possibilities. Many of the undesirable wells can be put into satisfactory use by shutting out certain water zones and opening other water zones that have been cased out. In some cases new wells might be drilled to the proper formation to replace old wells that are useless because of improper casing or insufficient size. If it can be demonstrated that some water zones will yield good water and that this water can be protected from other water in the well that contaminates the good water, then more towns will be favorable to the use of deep wells. In the present drouth situation, a deep well would be an asset as an auxiliary supply to the many towns with empty water reservoirs.

WATER ANALYSIS  
Sub-Project 1044-B

The preceding paragraphs dealing with well drilling studies indicate that a study of the mineral analysis of water is closely related and indispensable. Unfortunately, for this report, conclusions and compilation of findings cannot be made at this time. The work of recording is in progress but much is still to be done. Besides the purpose of furnishing basic data



to the geologist, the compiled data will demonstrate the suitability of water in a particular locality for industrial uses as well as from a public health standpoint.

It will be well to mention the extent of this research work and, briefly, the manner in which it is being conducted.

State field sanitary engineers collect the samples during the course of their regular duties, and forward them to the laboratory where five chemists are at work making tests and compiling records. Every effort is being made to make the analysis on every sample as comprehensive and accurate as possible. Before a test is reported it must conform to the limits of error as set forth in the United States Geological Survey Water Supply Paper No. 236. Results are reported to ionic form, but hypothetical combinations are made as an aid in interpreting the data and to serve as a check on the accuracy of the work.

Determinations are made for calcium and magnesium and similar constituents which are responsible for the hardness of waters. In addition to this, other determinations are made on less common constituents which until recently have not been seriously appreciated. For example, considerable importance is attached to the fluoride content of water because the fact has been established that where over two parts per million are found it produces a mottled effect on secondary teeth when exposed to the water during childhood. Borates, which have not previously attracted special attention, have been found in comparatively large amounts. Phosphates are also quite common in many water supplies. Iron and manganese are very significant if the water is to be used for laundry purposes. Tests for other

minerals, such as lead, copper, zinc, and tin are in immediate prospect and must be made.

It was decided that not less than 900 samples should be studied to provide a sound basis upon which reliable conclusions could be made. To the present writing approximately 350 water samples have been tested and recorded. The majority of these samples have been from deep and shallow wells providing public supplies. Before the study is completed, the waters of several lakes and rivers will also be analyzed.

The importance of the work cannot be over-emphasized. It will affect every community in the state and will be of monetary value to every enterprise desiring a water supply.

#### CLIMATOLOGY

In a study of water resources it would be natural to select the subject of climatology as the next part for consideration. A few words will be of interest on the matter of temperature. "The average annual temperature for the State as a whole is 48 degrees, ranging from 44 degrees along the north line to 52 degrees at Keokuk, the extreme southern point. In January, the coldest month, it averages 13 degrees along the middle of the north line to nearly 25 degrees at Keokuk, with a mean of 18.6 degrees, while in July, the warmest month, the difference is less, averaging about 71 degrees in the extreme north to 77 degrees in the extreme south, with a mean of 74 degrees. (Figure 1044-6). Cold waves are usually of the Boreal type, which rush southward over the State impelled by a mountain of super-cooled air that has been built up by radiation from the long

continued snow cover of northern Canada, awaiting opportunities to flow down steep barometric gradients in the rear of storm centers that move from southwest to northeast across Missouri . . . Hot winds and prolonged hot periods occur occasionally in July and August, as in 1886, 1894, 1901, 1916, 1918, and 1930, and 1934. They are usually more intense and damaging in the southwest counties, but are often mitigated in the northeast counties by the Great Lakes influence.\*\*

PRECIPITATION  
Sub-Project 1044-D

Precipitation is the ultimate source of all water resources in Iowa. The surface waters comprise in part a portion of moisture which has just fallen in the form of rain or snow and in part moisture which has found its way to the streams through underground channels. The underground fresh waters from aquifers which are too low to reappear naturally as surface water in the State originally appeared as rainfall - probably in neighboring states many years ago.

Precipitation supplies the waters which are necessary to sustain plant and animal life and to meet the needs of modern industries and modern cities by furnishing a source of power and water supply and convenient means for the disposal of wastes. Excessive precipitation is the chief cause of floods in Iowa which have caused great damage in rural and urban

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\* Marvin, Charles F., Chief, "Climatic Survey of the United States,"  
U. S. Department of Agriculture, Weather Bureau

NORMAL TEMPERATURE

Fig. 1044-6

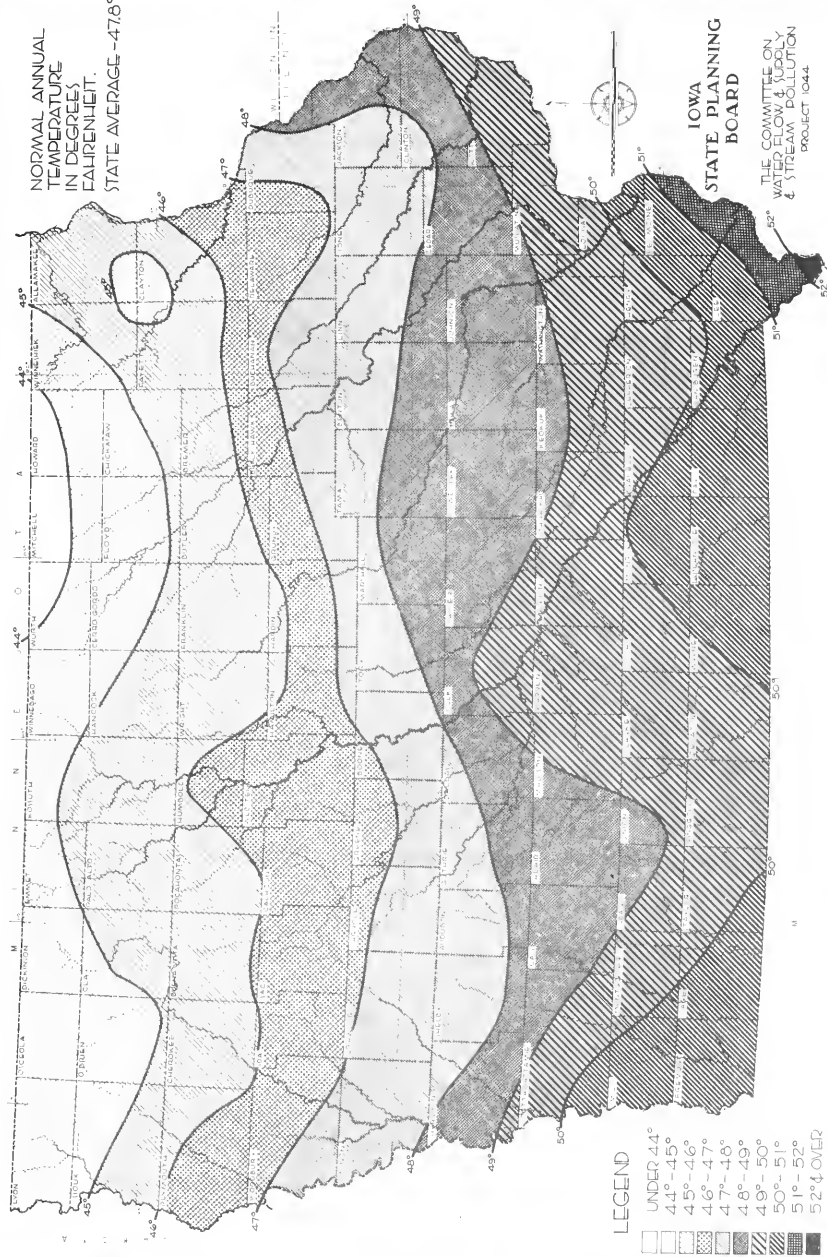
These normals have been so computed as to be equivalent to the averages of nearly a half century of records for all stations regardless of the actual length of record. For stations having less than 10 years of record or records that are known to depart widely from current records due to recent changes in exposure, the new normals were interpolated.

# IOWA STATE PLAN

## NORMAL

## TEMPERATURE

NORMAL ANNUAL  
TEMPERATURE  
IN DEGREES  
FAHRENHEIT.  
STATE AVERAGE -47.8°



### LEGEND

- UNDER 44°
- 44°-45°
- 45°-46°
- 46°-47°
- 47°-48°
- 48°-49°
- 49°-50°
- 50°-51°
- 51°-52°
- 52° & OVER

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PROJECT 1044

1044-6



districts alike. A lack of precipitation has occasionally caused untold suffering within the state to man and beast.

The close relationship between phases of rainfall study are shown graphically on Figure 1044-12. Precipitation, run-off, stream-flow and flood control are each a part of this cycle. Studies are to be made of the individual features and all data are to be brought up to date. In the final report consideration will be given to the close relationship of the studies and a correlation will be attempted. This has not been done before and should be of extreme importance when plans for the future are being made.

It is unlikely that precipitation can be controlled commercially, although recent news reports have heralded experiments to control fogs and precipitation on an extremely limited scale. Admitting that we are at present unable to regulate the amount of precipitation which reaches the earth's surface, can we hope to control it after it falls and thus insure protection against droughts and floods which result from abnormal rainfall? Man's success in this direction has been sufficient to indicate that such control is, in some measure at least, by no means impossible. It is self-evident, however, that any regulatory program must necessarily rest upon a broad foundation of fact and experience. Then too, such questions as the following must be answered:

1. What uses are to be made of the water?
2. How much water is required to meet the needs of all users in the State at large?

3. What has been the experience with reference to the occurrence of water within the state under natural, uncontrolled conditions?
4. How much water would be required - and, on the average, how often - to supplement the least amount obtainable under natural, uncontrolled conditions?
5. What have been the costs to the State at large of extreme excesses and deficiencies of rainfall in the past, and what would these losses mean in terms of an annual charge at the present time, based on present or reasonable future development?
6. What would be the annual carrying charge for the control works which could prevent the recurrence of damages and disasters due to floods and droughts?
7. Can the proposed remedial works be financed, and do the benefits exceed the costs?

The importance of existing rainfall and runoff records in the intelligent design of remedial works cannot be stressed too strongly. Inadequacy or complete failure are often the penalty for too much reliance upon judgments or estimates which are not based on facts or experience. The purpose of this work is to bring together hydrologic data which are applicable to Iowa problems and to analyze and summarize them in such form that they can be put to the best public use. The following is only a brief general outline of the broader aspects of the program for rainfall study:

- (1) Records - Assemble records of all stations and show what records are available.



(2) Annual rainfall

- (a) Show graphically variation of annual rainfall. Show also progressive five-year averages and means.
- (b) Map extremes of annual rainfall at selected stations.
- (c) Calculate trends and try to determine reliability of computed trends.
- (d) Investigate frequency of annual rainfall to determine how often greater (or less) than a given amount can be expected over long time period.

(3) Monthly rainfall - Determine experience of rainfall distribution during the months of the year. This is highly important in connection with surface water supplies, conservation, and recreational developments.

(4) Storm rainfall - Study importance, chance nature, frequency, intensity, and storm period lengths.

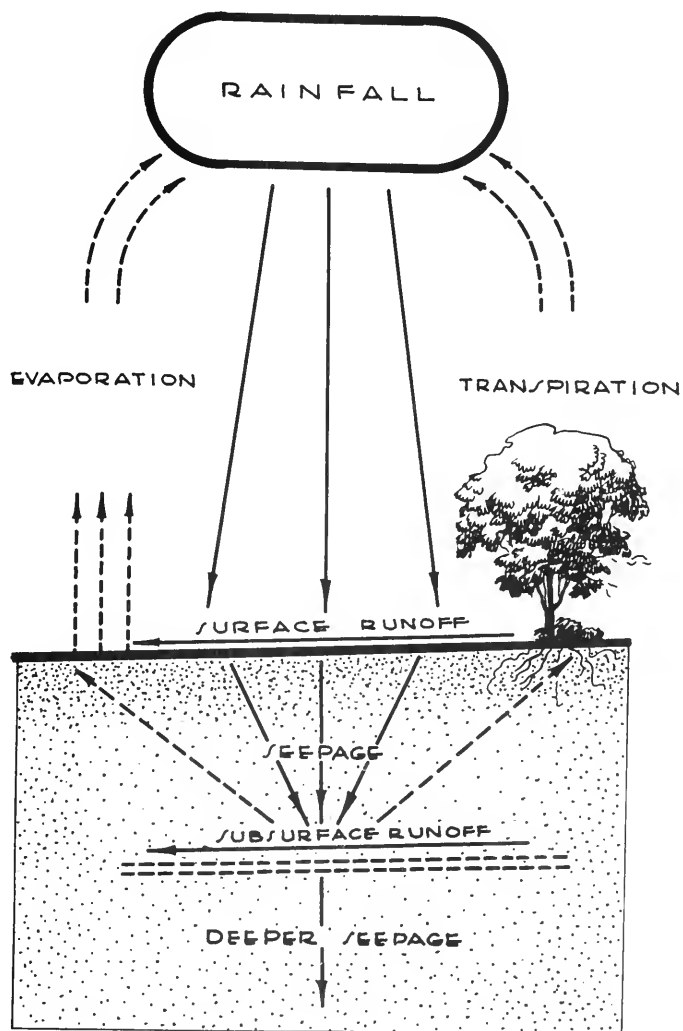
Since floods are primarily caused by heavy rainfall it is logical that their study be connected with rainfall studies. Storm rainfalls are vitally important in Iowa, first, because Iowa has had more than her share of the most intense rainfalls which have wrought havoc in the eastern United States, and second, because the floods on Iowa's streams are chiefly due to rainstorms of less than one week's duration.

It is proposed that the program for flood studies shall consist of (1) assembling flood records, (2) collecting information on flood damage and generalizing the data in terms of flooded depth and type of property, (3)

## RAINFALL CYCLE

Fig. 1044-12

A part of the precipitation which occurs in the form of rain or snow is evaporated immediately, a part runs off, and a part seeps into the ground. Of that which seeps into the ground a part is used by growing plants and given back to the atmosphere through transpiration, a part returns to the ground surface through capillarity and is evaporated from the ground surfaces, a part appears later as runoff from underground drains, and a part becomes deep seepage to reappear on other watersheds or in the waters of deep wells.



THE RAINFALL CYCLE



analyzing data to determine frequency of flood flows, (4) assembling engineering reports which have made recommendations for flood control projects in the state.

After the required basic data have been collected an attempt will be made to correlate rainfall and runoff for typical watersheds of the state.

The mean annual rainfall in Iowa, based on records of the U. S. Weather Bureau, varies from 26 inches in the northwest part of the state to 36 inches in the southeast part. There are more than 100 cooperative stations which are actively engaged in collecting climatological data and some 40 which were abandoned after they had collected at least ten years of records. The location of these stations together with the number of years of record at each are shown in Figures 1044-11. The current stations are divided into nine districts. Figure 1044-7 shows the annual rainfall and the five-year progressive average rainfall at the station having the longest record in each of the nine districts. Figure 1044-15 also shows the maximum and minimum amounts of precipitation which have occurred at the given station during each month of the year as well as the wettest and driest years of record.

In a paper entitled "Secular Trends of Iowa Precipitation," in the Annual Report of Iowa Weather and Crop Bureau of 1929, Charles D. Reed reported the discovery of a definite trend toward smaller annual rainfalls in the State. The trend found by Mr. Reed for the State as a whole was a decrease of 0.0364 inches per year for the years 1875 to 1927. Moreover, practically all of this annual decrease was found to occur in the summer

PRECIPITATION STATIONS

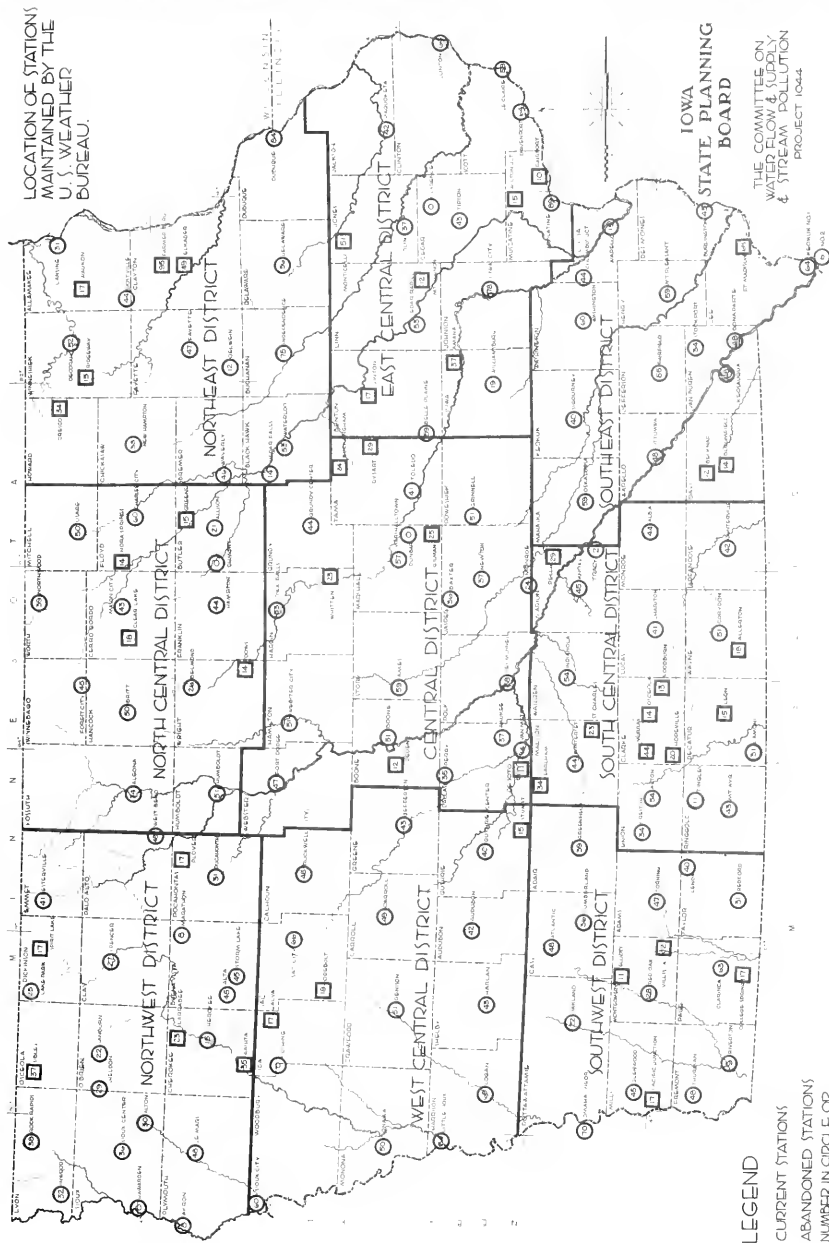
Fig. 1044-11

This map shows at a glance the stations in Iowa at which precipitation is measured or has been measured in the past as well as the length of record available at each point. Only those abandoned stations whose record covers a period of ten years or more are included.

# IOWA STATE PLAN

## PRECIPITATION STATIONS

## STATIONS



1044-11





months, there being little change in the average rate of precipitation during other seasons. Mr. Reed's studies showed that the decrease in rainfall had been greatest in the southwest corner of the state and fairly large along a diagonal line between the southwest and northeast corners of the state. Very little decrease had occurred in the northwest and southeast corners. Since the trend for a particular period evidently depends both upon the length of the record and its time of occurrence, it was decided to continue trend studies and it was thought best to consider the 39-year period from 1895 to 1933, inclusive. A surprising correlation became evident when the results of these trend studies were shown on a map. (Figure 1044-9) It was found that a region in the eastern part of the State, centering around Washington, had been receiving increasing amounts of rainfall since 1895, whereas the western part of the state had experienced decreasing rainfall for the same period and this decrease apparently grew greater toward the western boundary line.

Apparently there occur long periods of decreasing rainfall which are followed by periods of increasing rainfall. But the fluctuations in the records show conclusively that it is impossible to make a reliable statement concerning the general trend of precipitation until many more years of record are available than are available at the present time.

Further trend studies were made and while the results may suggest a cycle they cannot in any way define it. The period of record is still too short to justify a statement as to the occurrence of rainfall cycles.

VARIATION OF MONTHLY PRECIPITATION

Fig. 1044-15

The variation in monthly rainfall for a representative station in each district is here shown. The mean monthly rainfall as well as the extremes of monthly rainfall are presented. Evident from the figure is the fact that the rainfall for a given month may vary from the mean value by several hundred per cent.

# IOWA STATE PLAN

# PRECIPITATION

# VARIATION

VARIATION IN  
MONTHLY PRECIPITATION  
AT REPRESENTATIVE  
STATIONS

LE MADE

ACTIVE - 1950  
DECEMBER - 1950  
JANUARY - 1951  
FEBRUARY - 1951  
MARCH - 1951  
APRIL - 1951  
MAY - 1951  
JUNE - 1951  
JULY - 1951  
AUGUST - 1951  
SEPTEMBER - 1951  
OCTOBER - 1951  
NOVEMBER - 1951  
DECEMBER - 1951

ALGONA

ACTIVE - 1950  
DECEMBER - 1950  
JANUARY - 1951  
FEBRUARY - 1951  
MARCH - 1951  
APRIL - 1951  
MAY - 1951  
JUNE - 1951  
JULY - 1951  
AUGUST - 1951  
SEPTEMBER - 1951  
OCTOBER - 1951  
NOVEMBER - 1951  
DECEMBER - 1951

LOGAN

ACTIVE - 1950  
DECEMBER - 1950  
JANUARY - 1951  
FEBRUARY - 1951  
MARCH - 1951  
APRIL - 1951  
MAY - 1951  
JUNE - 1951  
JULY - 1951  
AUGUST - 1951  
SEPTEMBER - 1951  
OCTOBER - 1951  
NOVEMBER - 1951  
DECEMBER - 1951

OMAHA

ACTIVE - 1950  
DECEMBER - 1950  
JANUARY - 1951  
FEBRUARY - 1951  
MARCH - 1951  
APRIL - 1951  
MAY - 1951  
JUNE - 1951  
JULY - 1951  
AUGUST - 1951  
SEPTEMBER - 1951  
OCTOBER - 1951  
NOVEMBER - 1951  
DECEMBER - 1951

INDIANOLA

ACTIVE - 1950  
DECEMBER - 1950  
JANUARY - 1951  
FEBRUARY - 1951  
MARCH - 1951  
APRIL - 1951  
MAY - 1951  
JUNE - 1951  
JULY - 1951  
AUGUST - 1951  
SEPTEMBER - 1951  
OCTOBER - 1951  
NOVEMBER - 1951  
DECEMBER - 1951

DECATUR

ACTIVE - 1950  
DECEMBER - 1950  
JANUARY - 1951  
FEBRUARY - 1951  
MARCH - 1951  
APRIL - 1951  
MAY - 1951  
JUNE - 1951  
JULY - 1951  
AUGUST - 1951  
SEPTEMBER - 1951  
OCTOBER - 1951  
NOVEMBER - 1951  
DECEMBER - 1951

KEOKUK

ACTIVE - 1950  
DECEMBER - 1950  
JANUARY - 1951  
FEBRUARY - 1951  
MARCH - 1951  
APRIL - 1951  
MAY - 1951  
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JULY - 1951  
AUGUST - 1951  
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OCTOBER - 1951  
NOVEMBER - 1951  
DECEMBER - 1951

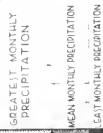
MUSCATINE

ACTIVE - 1950  
DECEMBER - 1950  
JANUARY - 1951  
FEBRUARY - 1951  
MARCH - 1951  
APRIL - 1951  
MAY - 1951  
JUNE - 1951  
JULY - 1951  
AUGUST - 1951  
SEPTEMBER - 1951  
OCTOBER - 1951  
NOVEMBER - 1951  
DECEMBER - 1951

DUBUQUE

ACTIVE - 1950  
DECEMBER - 1950  
JANUARY - 1951  
FEBRUARY - 1951  
MARCH - 1951  
APRIL - 1951  
MAY - 1951  
JUNE - 1951  
JULY - 1951  
AUGUST - 1951  
SEPTEMBER - 1951  
OCTOBER - 1951  
NOVEMBER - 1951  
DECEMBER - 1951

## LEGEND



IOWA  
STATE PLANNING  
BOARD

THE COMMITTEE ON  
WATER RESOURCES  
AND STREAM POLLUTION  
PROJECT 1044

1044-15



## FLOOD CONTROL

So far, time has not permitted an exhaustive study of storm rainfall, which is primary in importance to a study of floods. However, some material has been gathered and a few field trips have been made. It is far too early in the study period, of course, to draw any conclusion concerning flood studies or attempt any correlation between rainfall and runoff.

It might be well to introduce the subject by presenting some of the material contained in a treatise entitled "A Survey of Iowa Floods" written by the late Floyd A. Nagler,\* an eminent authority on hydraulic engineering. "While the annual amount of precipitation received is no index whatsoever of the magnitude of the rainstorms that may be expected, it may indicate to some degree the frequency with which such storms occur. Thus it is interesting to note that whereas the average annual precipitation received by the state as a whole is 32.24 inches, there is a decrease of 10 inches in the normal annual precipitation as one passes from the southeast to the northwest corner of the State. This is indicated by the isohyetal contours drawn across the map of Iowa which is shown in Figure 1044-10... Great floods on the larger rivers of Iowa are generally produced by widespread storms following periods of wet weather which have thoroughly saturated the soil. In this connection it is significant to note that there is hardly a rainfall

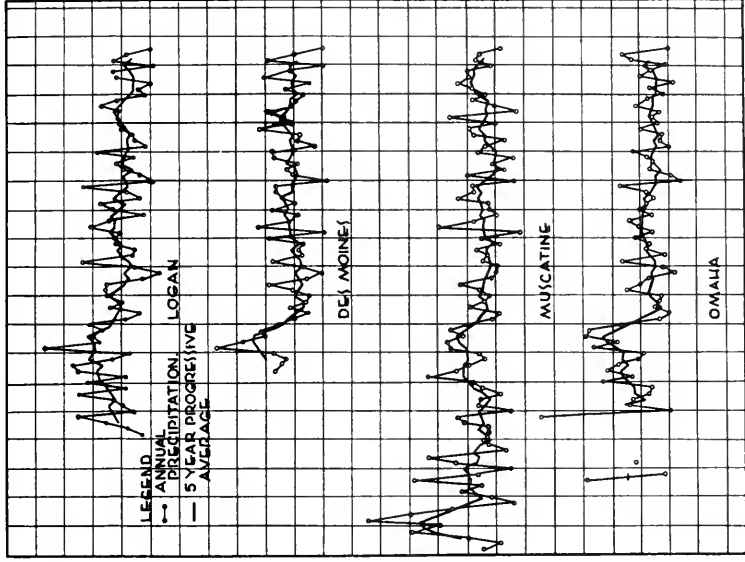
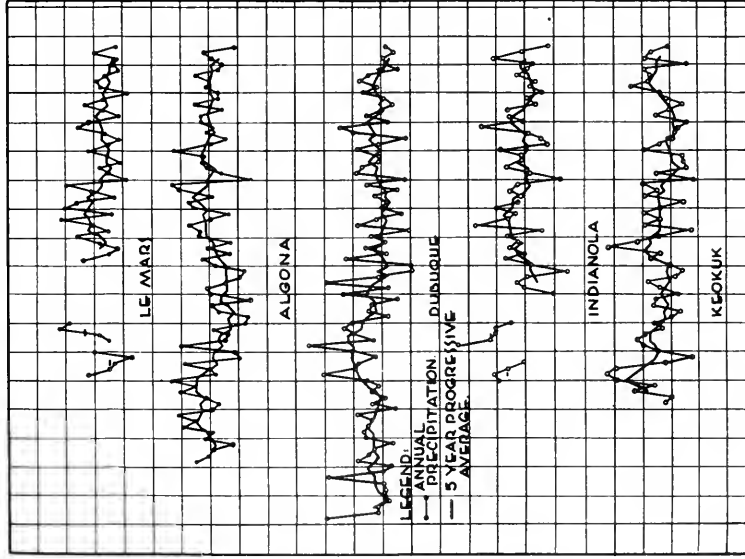
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\* Nagler, Floyd, "A Survey of Iowa Floods," Report for Bulletin of the Assoc. State Engineer Societies Oct. 1928.

ANNUAL RAINFALL  
and  
FIVE YEAR PROGRESSIVE AVERAGE

Fig. 1044-7

The annual rainfall for each year of record is here shown for the station having the longest record in each of the nine districts. The heavy line shows a five year progressive average of the annual precipitations. Noticeable in practically every case is the occurrence of greater precipitation in the neighborhood of 1880 than during recent years. Also noticeable is the absence of any regular variation in the average rainfall which might indicate a regular cycle of large and small amounts of annual precipitation.



IOWA STATE PLANNING BOARD  
 ANNUAL PRECIPITATION  
 AT REPRESENTATIVE STATIONS

IO44-7





record in Iowa which has been kept longer than 20 years which has not at some time during the month of June, July, August, or September recorded a monthly total of rainfall exceeding 10 inches . . . The largest floods on the smaller streams of Iowa are the result of intense storms which may be only of a few hours duration . . . Compared with adjoining states, Iowa has received more than her share of "cloudbursts" . . . A study of the records of flow on Iowa streams indicates two annual periods in which floods are most frequent and largest in magnitude. One flood period occurs early in the spring during the last few days in March and the other period is in the early summer during the last of May, and the first half of June. The highest known floods on the Cedar, Iowa, Skunk, Des Moines, and Maquoketa Rivers have occurred close to the first day of June."

In view of the fact that flood studies are under way it does not seem advisable to go further into material which will eventually be worked into an up-to-date and more complete report. The necessity of a flood control program is beyond question and the information and data now being collected will be of utmost importance. The small cost of conducting this investigation will, without doubt, be repaid to the State of Iowa in the development of a single control project.

Precipitation studies, flood studies, and stream gauging studies are so closely concerned with one another that it is difficult to speak of them separately.

# PRECIPITATION TREND

Fig. 1044-9

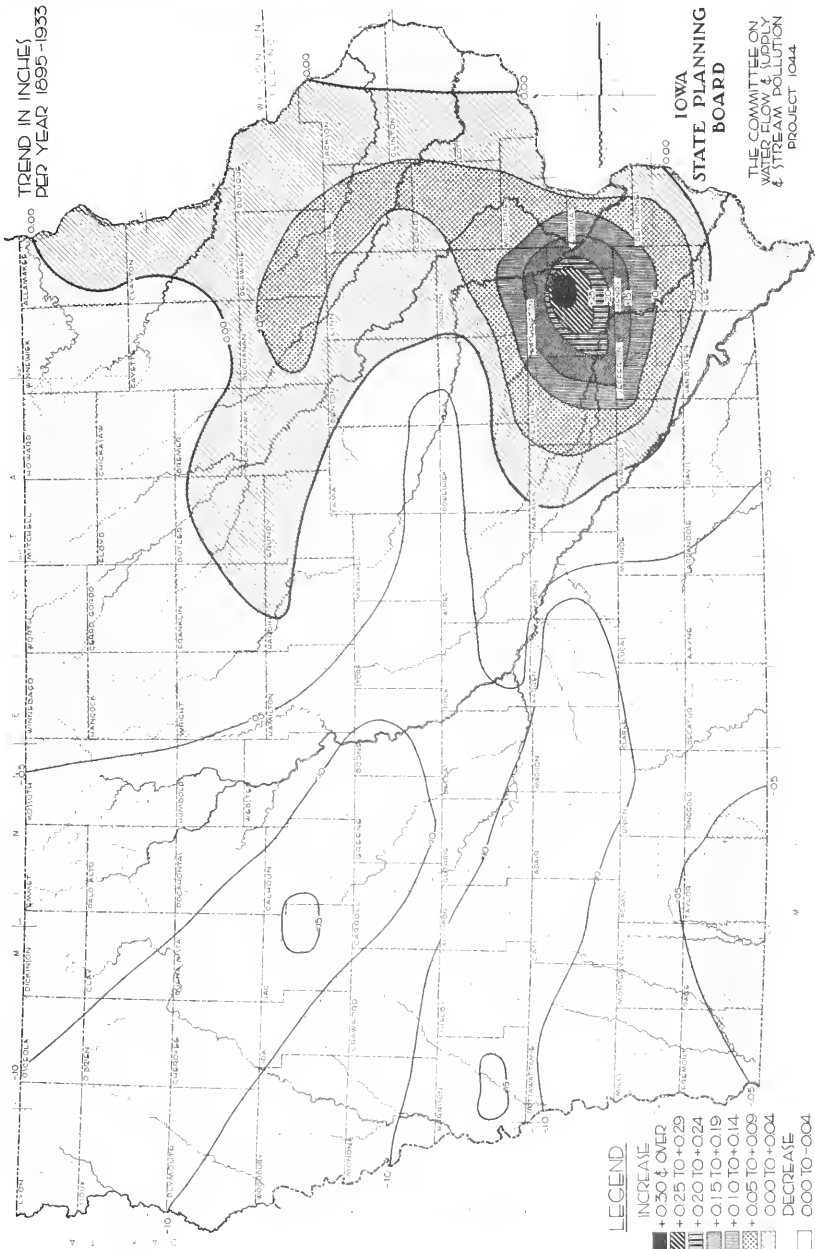
The results of a trend study covering the 39-year period from 1895 to 1933 are here shown graphically. It will be seen that the eastern third of the state has experienced increasing amounts of annual rainfall during this period while the remainder of the state has had the opposite experience. These conclusions were drawn from the records of 38 representative stations.

# IOWA STATE PLAN

## PRECIPITATION

## TREND

TREND IN INCHES  
PER YEAR 1995-1933



### LEGEND

#### INCREASE

- ▨ +0.30 & OVER
- ▨ +0.25 TO +0.29
- ▨ +0.20 TO +0.24
- ▨ +0.15 TO +0.19
- ▨ +0.10 TO +0.14
- ▨ +0.05 TO +0.09
- ▨ 0.00 TO +0.04
- DECREASE
- 0.00 TO -0.04
- -0.05 TO -0.09
- -0.10 TO -0.14
- -0.15 & OVER

IOWA  
STATE PLANNING  
BOARD

THE COMMITTEE ON  
WATER FLOW & SUPPLY  
& IRRIGATION  
PROJECT 1044



STREAM FLOW  
Project 1046

A knowledge of the quantity and seasonable distribution of flow in rivers or streams is necessary to any program for their development. It is also essential to know the maximum and minimum flows and stages over long periods of time, since these extreme high and low points are limiting factors in design. Stream flow records are of basic value for many purposes, such as water supply investigations; the design and operation of storage reservoirs; flood protection works; water power developments; and adjudication of claims; the determination of bridge clearances and culvert openings; the study and control of stream pollution, and many others. Since stream flow varies widely from day to day, from month to month, and from year to year, it is obvious that records of flow reach their highest value through the continued maintenance of gauging stations over long periods of time. Records of stream flow for short periods of time only may actually be misleading.

Before this type of data can be recorded it is necessary to have the proper apparatus, which in this work means gauging stations. Before the start of this present program there were 30 gauging stations located throughout the state. In order that a comprehensive study could be made it was deemed best to erect other stations at certain points. Figure 1046-1 illustrates the locations of the old and the new stations. Pictures 1046-A and 1046-B, presented here show typical new stations, and the diagrammatic perspective sketch (Figure 1046-2) explains the typical construction.

# NORMAL PRECIPITATION

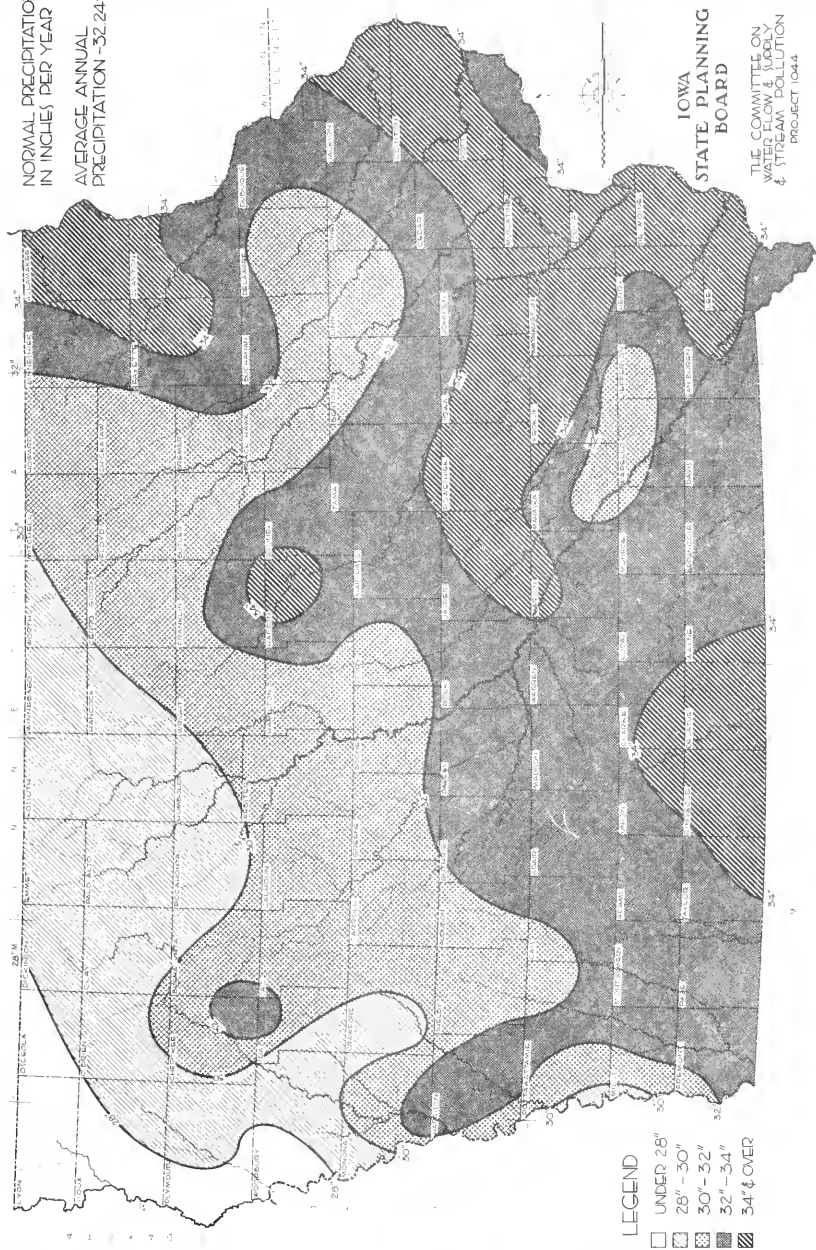
Fig. 1044-10

While the annual amount of precipitation received is no index whatsoever of the magnitude of the rainstorms that may be expected, it may indicate to some degree the frequency with which such storms occur. Thus it is interesting to note that whereas the average annual precipitation received by the state as a whole is 32.24 inches, there is a decrease of 10 inches in the normal annual precipitation as one passes from the southeast to northwest corner of the state. This is indicated by the isohyetal contours drawn across the map.

## NORMAL PRECIPITATION

NORMAL PRECIPITATION  
IN INCHES PER YEAR

AVERAGE ANNUAL  
PRECIPITATION - 32.24"

IOWA  
STATE PLANNING  
BOARD

THE COMMITTEE ON  
WATER FLOW & SUPPLY  
& STREAM POLLUTION  
PROJECT 1044





The direct purpose of this program is to obtain exact data on stream flow and to record the findings for future reference. During the period between 1917 and 1927 work was carried on in a minor way by the United States Geological Survey. Funds were insufficient to carry on the work in an adequate way and it was not until October of 1932 that the work was again taken up. A single United States Geological Survey engineer handled the collection of data and measurements until late in 1933 when through the help of C.W.A. and P.W.A. the work was expanded somewhat. The present program was instituted under the Iowa State Planning Board through the aid of F.E.R.A. labor. The first step to be taken was the erection of gauging stations and the present time sees six stations completed or nearing completion and four more are contemplated.

Construction work has been completed at the following points:

- (1) Racoon River at Van Meter  
Concrete well and house for recording gauge -- with necessary appurtenances.
- (2) Skunk River near Ames  
Re-built gauge well and shelter, installed staff gauges, repaired and painted gauging cable, and constructed concrete artificial control.
- (3) Wapsipinicon River near Dewitt  
Concrete gauge well and shelter for recording gauge -- construction of rock reef for artificial control.

The following described work is under construction:

- (1) Iowa River at Marshalltown  
Concrete gauge well and timber shelter for recording gauge -- with necessary appurtenances.
- (2) Mississippi River at Dubuque  
Concrete gauge well and shelter for recording gauge -- with necessary appurtenances.

## GAUGING STATIONS

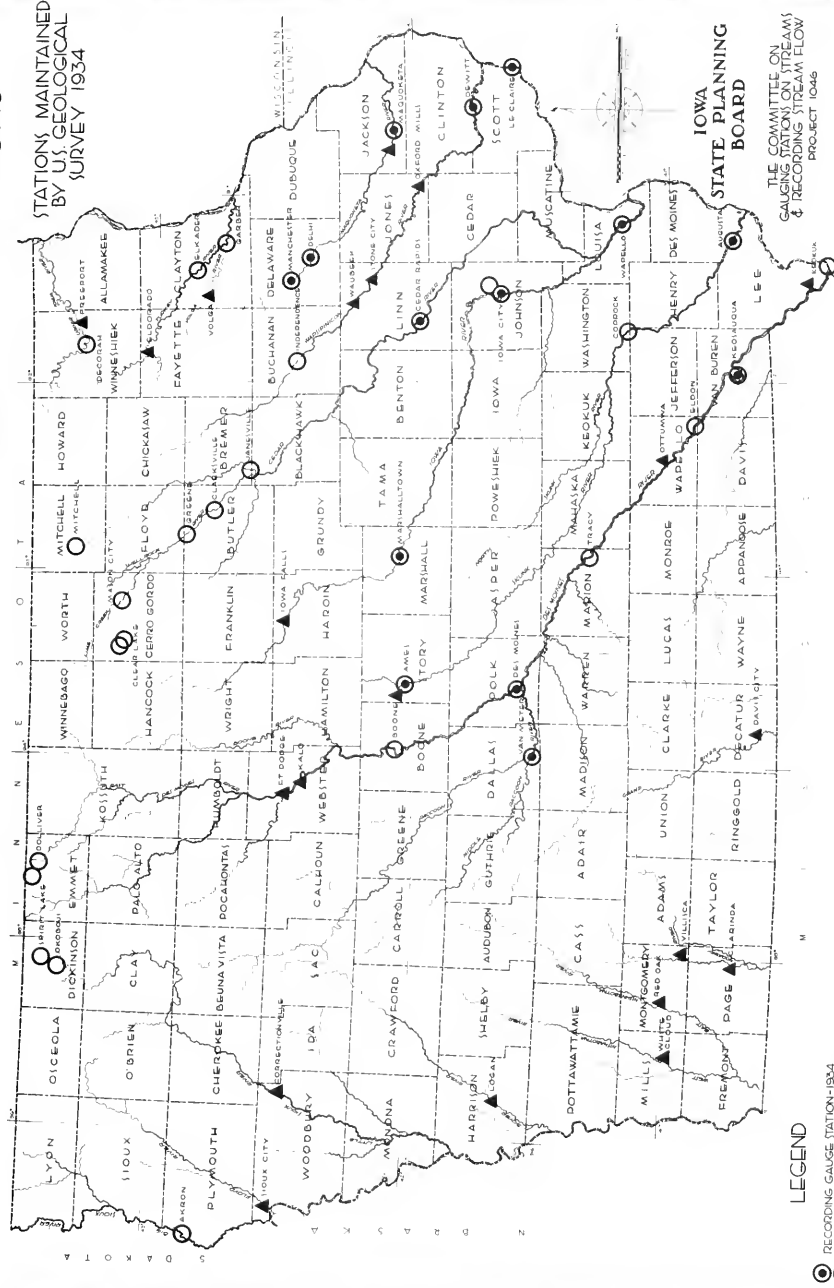
Fig. 1046-1

This map shows the location and types of the thirty-four gauging stations now being maintained in Iowa by the Iowa City office of the U. S. Geological Survey. It also shows location of gauging stations which were maintained for short periods (less than two years) prior to 1927. Although there is need for discharge records on these streams, there are not now available sufficient funds to permit the maintaining of gauging stations.

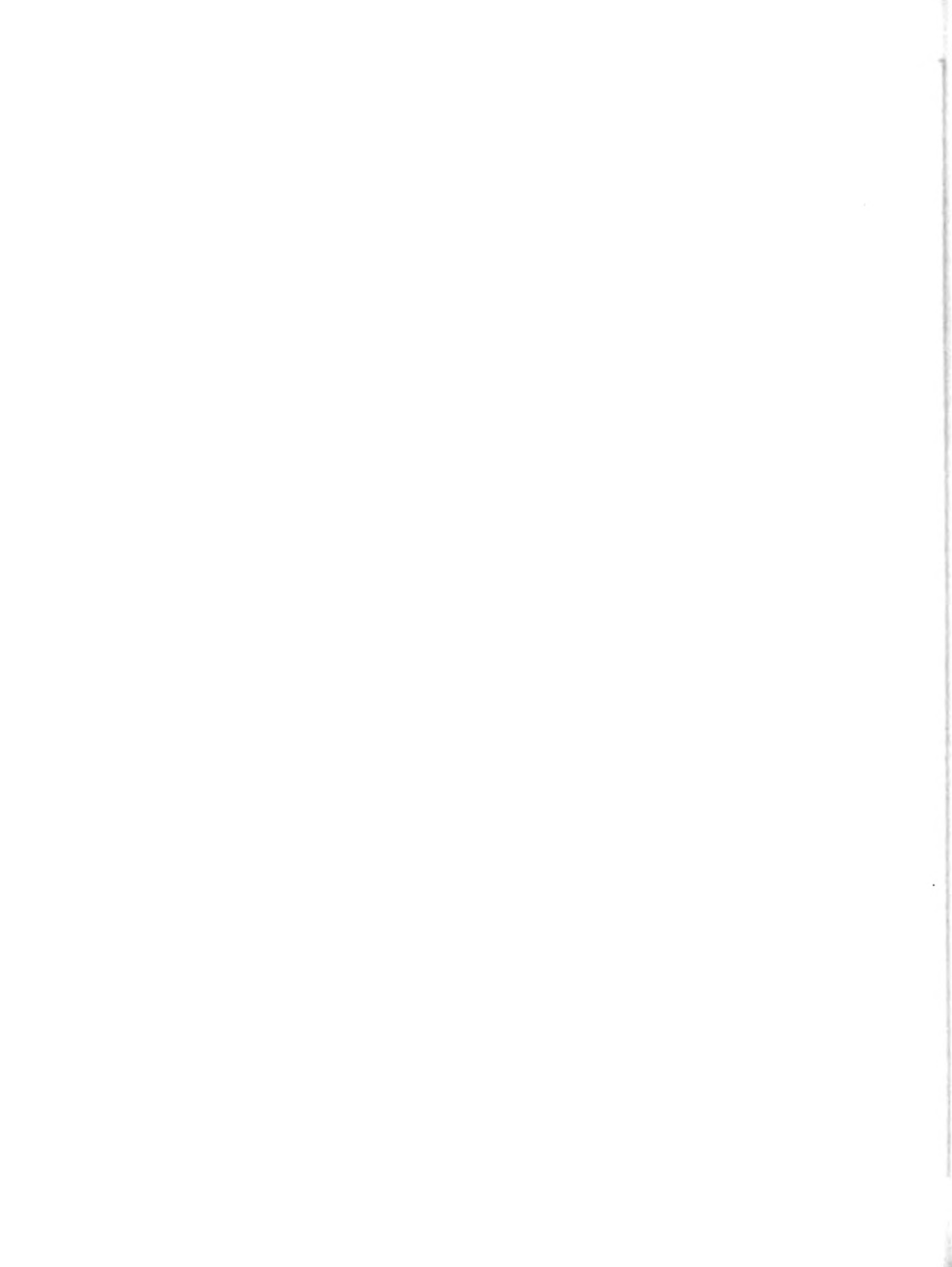
# IOWA STATE PLAN

## GAUGING STATIONS

## STATIONS MAINTAINED BY U.S. GEOLOGICAL SURVEY 1934



1046-1



- (3) Skunk River at Augusta  
Concrete gauge well and shelter for recording gauge —  
with necessary appurtenances.

For the last two months the following described work is planned:

Construction

- (1) Des Moines River at Eldon  
Recording gauge installation.
- (2) Lime Creek at Mason City  
Recording gauge and concrete artificial control.
- (3) Missouri River at Sioux City  
Recording gauge installation.
- (4) Big Sioux River at Akron  
Recording gauge installation.

Certain compilations of past records have been made but the work as a whole is not sufficiently far advanced to warrant the drawing of any conclusion. It is amazing to the uninitiated to observe the thoroughness of these compilations, which include such phases as (1) a detailed description of the station and the factors affecting the record, (2) a chronological list of all discharge measurements for each station, (3) tables of average daily discharge, (4) tables of monthly discharge and runoff with annual summary, (5) duration curves, (6) river profiles, (7) drainage areas and general description, (8) flood data, and several others. That this is a big problem will be realized when it is remembered that there are approximately 50 stations from which records have been obtained.

Picture 1046-A

UPSTREAM VIEW OF GAUGING STATION ON  
WAPSIPINICON RIVER NEAR DEWITT, IOWA  
JULY, 1934

Picture 1046-B

TYPICAL CONCRETE GAUGE WELL AND SHELTER  
FOR HOUSING AUTOMATIC WATER-STAGE RECORDER  
WAPSIPINICON RIVER NEAR DEWITT, IOWA  
JULY, 1934







PUBLIC WATER SUPPLY  
Sub-Project 1044 - A

A cooperative working plan between the State Department of Health and the Iowa State Planning Board was instituted to obtain a more accurate picture of the Public Water Supplies of the State. This permitted a closer concentration on the actual information desired and minimized the possibility of unnecessary duplication.

The source of supply for all incorporated municipalities and present manner of treatment is indicated in Figure 1044-13. In a number of locations a star designates the presence of fluorides in sufficient quantity to have a toxic effect. This point is receiving considerable attention not only in Iowa but in some of our western states where injurious results have been traced to this source. Further study is being carried on to determine the treatment or possible control of this element. Table No. 1044-B recapitulates the information in respect to percentage of population served and Table No. 1044-C shows the source with regard to size of municipality.

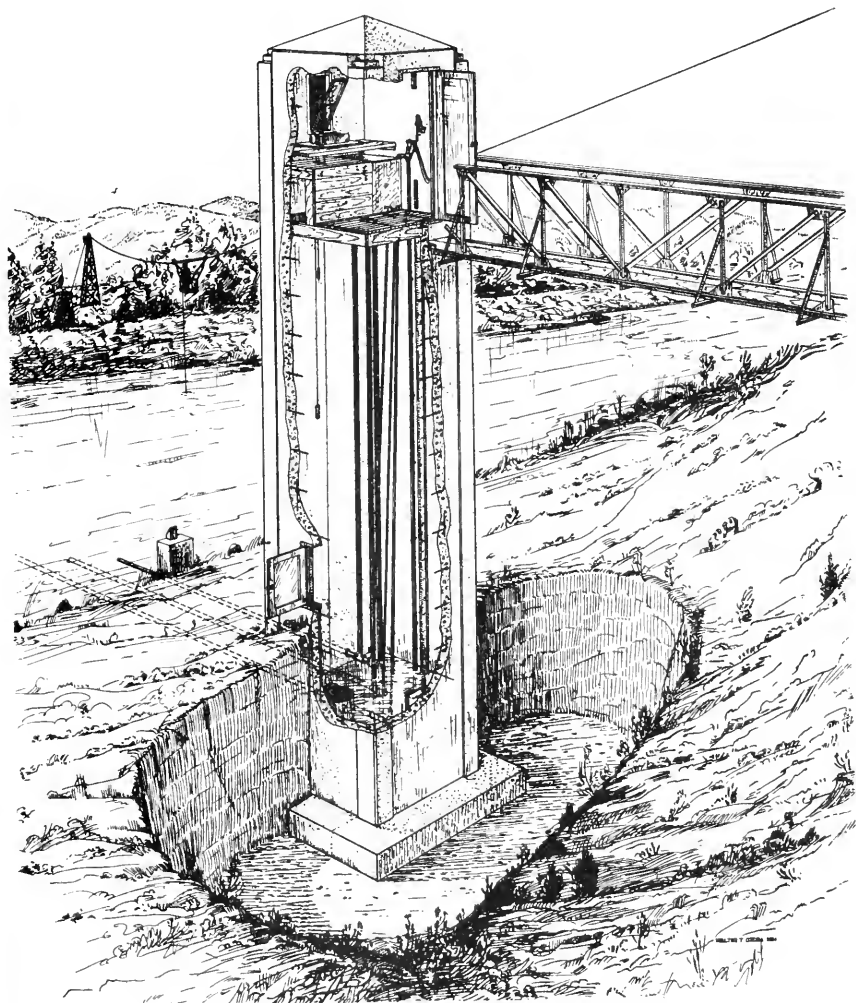
In this regard it is interesting to note that while 91 per cent of the municipalities are served by well supplies, nevertheless 39 per cent of the population are dependent on surface waters, springs, or infiltration.

It has been necessary to supplement the State Department of Health's records by field investigations especially as pertaining to the surface water supplies in the southern part of the State. As a general statement,

# DIAGRAMITIC SKETCH OF GAUGING STATION

Fig. 1046-2

In this sketch are shown the essential features of a typical river gauging station. In the background may be seen a cableway from which the discharge measurements are made. Discharge measurements may also be made from suitable highway or railroad bridges. The recording gauge installation consists of a concrete stilling well, concrete house or shelter to house the continuous water stage recorder, intake pipes to well with flushing device, and inside and outside staff gauges to which the recorder is referred. Timber or large corrugated iron pipe may also be used for the well and shelter but the use of concrete insures a permanent, better appearing structure, proof against ice jams, floods, and fire.



DIAGRAMMATIC SKETCH OF  
GAUGING STATION

1046-2



TABLE NO. 1044-B

	INCORPORATED MUNICIPALITIES			INCORPORATED MUNICIPALITIES HAVING PUBLIC WATER SUPPLIES			INCORPORATED MUNICIPALITIES NOT HAVING PUBLIC WATER SUPPLIES		
	NO.	POP.	NO.	PER CENT OF TOTAL NUMBER	POP.	PER CENT OF TOTAL POPULATION	NO.	POP.	PER CENT OF TOTAL POPULATION
1st Class Cities Population over 15,000	16	659,860	16	100	659,860	100	0	0	0
2nd Class Cities Population 2,000 to 15,000	95	382,179	94	99	380,226	99.5	1	1935	0.5
Incorporated towns Population 1,000 to 2,000	93	124,662	92	99	122,989	99	1	1673	1.3
Incorporated towns Population 500 to 1,000	212	146,757	176	83	123,484	84	36	23,273	15.8
Incorporated towns Population 350 to 500	131*	54,268*	82	63	34,539	63	50	20,634	38.0
Incorporated towns Population under 350	367*	77,488*	83	23	20,812	26	289	57,334	73.9
TOTAL-ALL incorpor- ated municipalities	914	1,444,214	543	59.4	1,340,910	92.8	377	104,868	7.2

\* The unincorporated Amana colonies, all of which have public water supplies, are not included in these figures.

TABLE NO. 1044-C

	MUNICIPALITIES HAVING DEEP WELLS		MUNICIPALITIES HAVING SHALLOW WELLS		MUNICIPALITIES HAVING BOTH DEEP AND SHALLOW WELLS		MUNICIPALITIES HAVING SURFACE WATER SUPPLIES		MUNICIPALITIES HAVING SPRING OR INFILTRATION	
	NO.	POP.	NO.	POP.	NO.	POP.	NO.	POP.	NO.	POP.
1st Class Cities Population over 15,000	5	131,787	2	62,969	1	17,773	7	544,172	1	145,559
2nd Class Cities Population 2,000 to 15,000	38	134,963	27	107,852	7	34,711	16	82,405	6	13,995
Incorporated Towns Population 1,000 to 2,000	49	65,834	26	37,398	7	10,024	8	10,882	2	2,857
Incorporated Towns Population 500 to 1,000	106	72,458	50	25,429	15	11,056	4	2,907	1	632
Incorporated Towns Population 250 to 500	51	21,292	27	11,525**	3	1,279	1	473	0	0
Incorporated Towns Population under 250	45	10,694*	72	8,656	4	1,046	1	254	1	162
Totals	294	438,028	164	259,829	37	75,489	37	342,053	11	165,500

Per Cent of All

Municipalities  
Having Water Supply 54

37.2

5.6

25.6

12.3

\* East and Upper South Amara population not included.

\*\* Includes Middle Amara and Amara.

acute water shortage as a result of the 1934 drought is being felt only in the southern third of the State among the municipalities depending upon surface water sources. Complete failures have occurred at Corning, Creston, Mt. Ayr, Bedford, Tabor and imminent shortage is pending at Fairfield, Chariton, and Albia.

In the western third of the State most of the municipalities depend upon shallow wells and while there are a number of municipalities where shortage exists, complete failures have not been noted.

In the central, northern, and eastern portions of the State where principal dependence is placed upon deep wells the drought apparently has had no effect.

The water supply situation as regards farm wells is far different. The situation is very acute in the southern third of the State and is serious in the central and western portions. Shortage in farm wells has occurred to some extent over the entire state.

A physical inventory of our water as to location, quality, amount, and expectation is a basic need not only for long time planning but for immediate use in emergency measures. In this phase of our study we will make a complete report on the separate municipalities as to:

1. Adequacy of supply and distribution system.
2. Sanitary quality of water economically available.
3. Mineral quality of water.

These data will then be a part of a correlated plan prepared by the Iowa State Planning Board.

Included in this plan will be a survey of stream pollution throughout

WATER SUPPLY SITUATION

Fig. 1044-13

The source of all water supplies for incorporated municipalities is shown. The legend gives the key to the water source and the manner of treatment, while the depth of wells is indicated in hundreds of feet. The presence of an injurious quantity of flouride in the water supply is denoted by a star.



## WATER SUPPLY SITUATION



THE COMMITTEE ON  
WATER FLOW & SUPPLY  
& STREAM POLLUTION  
PROJECT 1044

1044-13



the state. Some of this material is already on file with the State Department of Health and other parts are being worked up by field parties at this time. It is particularly essential to think of stream pollution in connection with water supply and also as a factor in the study of waste disposal.

WASTE DISPOSAL  
Sub-Project 1044-A

Adequate facilities for sewage disposal have an important relation to pollution of streams from which many public water supplies may be taken. The relieving of the streams from carriage of waste will go far toward beautifying the river and stream valleys and providing safe recreational facilities. But it is from the standpoint of health that the proper disposal of waste matter should receive its greatest emphasis.

The project now under way will provide data and information which will ultimately be compiled and used to determine the adequacy of existing plants, the need for new plants, their size and type, and the adequacy of collecting systems.

It will be well first to present the existing condition of the state as a whole in regard to waste disposal. The map presented, Figure 1044-14, indicates the locations of public sewer systems and shows the method of treating waste matter. At the date of this writing it was impossible to state the adequacy of each treatment system and no attempt has been made to differentiate between complete and partial treatment.

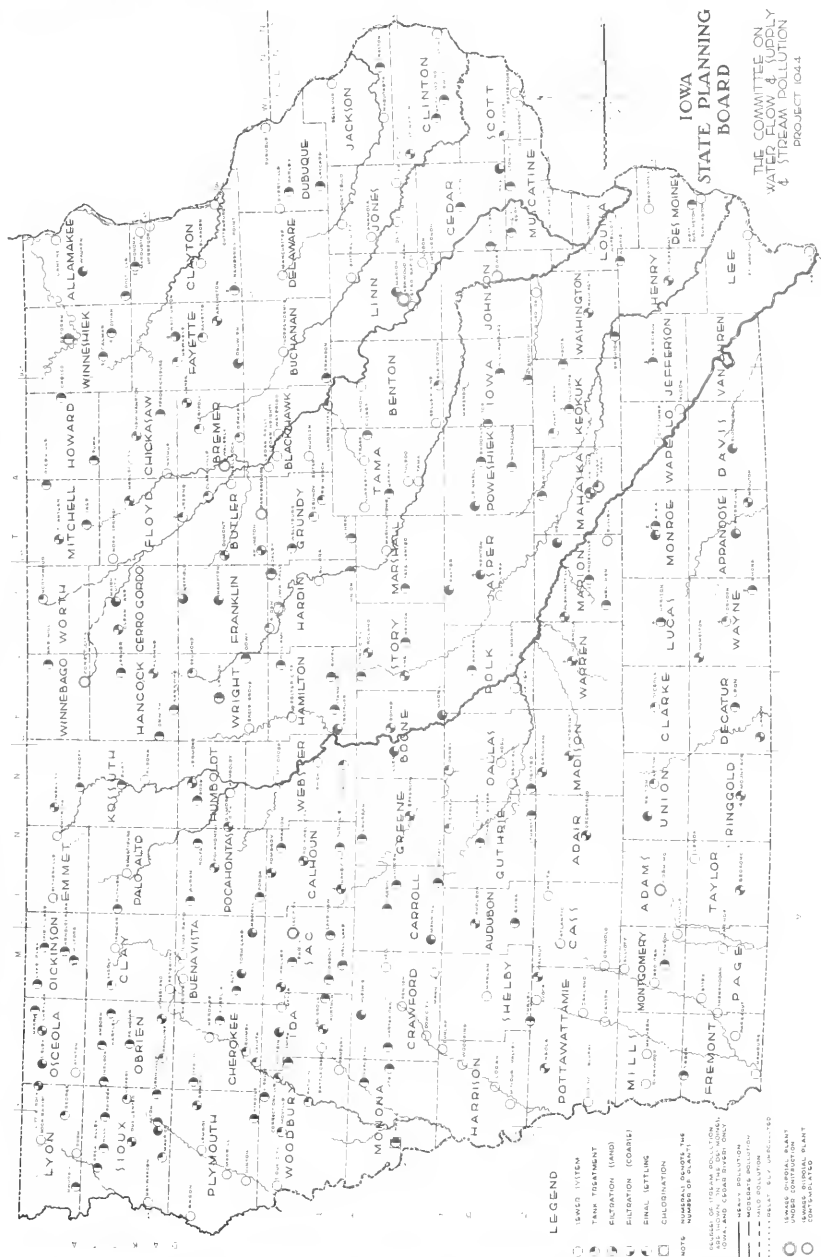
The cities and towns have been divided into five classifications to

SEWAGE DISPOSAL SITUATION

Fig. 1044-14

Incorporated municipalities having public sewer systems are indicated and the type and degree of treatment designated. Adequacy of treatment is not here shown and will be determined during the next working period.

## IOWA STATE PLAN

IOWA  
STATE PLANNING  
BOARD

THE COMMITTEE ON  
WATER FLOW & SUPPLY  
& STREAM POLLUTION  
PROJECT 1044

1044-14



serve as a basis for information on this subject. Tables 1044-D and 1044-E contain many interesting facts and correlations can be easily made. It will be noted that there are 914 cities and towns with a total population of 1,444,042. The tables show that only 35 per cent of the cities and towns have sewer systems yet they serve nearly 86 per cent of the total population. Of these 323 communities, representing 35 per cent of the total, only 216 have sewage treatment of some sort and only approximately 31 per cent of the total population are affected by these treatment plants. It is amazing to note that only one city of the first class treats its waste material and this city represents only three and one-half per cent of the population of this class.

It can be realized that the matter of sewage disposal is vital to the health of the state especially during years of excessive drought. In a matter of this importance the extreme conditions must be the determining factors in the establishing of disposal facilities.

This problem must be studied from a much longer view than that of individual cases. Complete streams and rivers are to be analyzed and the weakest links strengthened. Only thus can we be assured of a balanced arrangement between water purification and waste treatment.

MEANDERED STREAM SURVEY  
Project 1045

There are, under the State Board of Conservation, some 111 meandered streams involving approximately 800 miles of river channel and about 65 natural lakes of over 40,000 acres. Along the banks of these rivers and

TABLE 1044-D

PUBLIC SEWER SYSTEMS IN IOWA

1934

	Population Distribution		Those Having Sewer Systems			
	NO.	POP.	NO.	POP.	PER CENT NUMBER	PER CENT POPULATION
Cities First Class, Population greater than 15,000	16	658,860	16	658,860	100	100
Cities Second Class, Population 2,000 to 15,000	94	380,869	89	372,106	94.7	98
Towns Population 1,000 to 2,000	94	125,975	90	123,178	95.8	97.8
Towns Population 500 to 1,000	212	146,755	104	76,697	49	52.3
Towns Less than 500 Population	498	131,583	24	9,686	5	7.3
	914	1,444,042	323	1,240,527	35.3	85.9



TABLE 1044-E

SEWERAGE DATA ON IOWA CITIES AND TOWNS  
(Based on 1930 Population)

	Having Sanitary Sewers		Treating Sewage		Population Served By Sanitary Sewers Where Sewage is Treated
	NO.	POP.	NO.	POP.	PER CENT
Cities of First Class Population greater than 15,000	16	658,860	1	23,304	3.5
Cities of Second Class Population 2,000 to 15,000	89	372,106	46	203,129	54.6
Towns Population 1,000 to 2,000	90	123,178	68	92,810	75.3
Towns Population 500 to 1,000	104	76,697	79	59,710	77.0
Towns Less than 500 Population	24	9,686	22	9,037	93.3
Total	323	1,240,527	216	387,990	31.3

lakes erosion is taking place and in some cases is doing considerable damage. This erosion, besides causing damage to the adjacent land, is harmful to the stream channel itself.

In various places silt is being deposited over the river bed to such an extent that it is impossible for fish to survive. Of course, navigation for the smallest of boats is impossible. In other instances bars have been formed almost completely crossing the stream. These have a direct bearing on flood areas.

Of the 65 natural lakes in the state many are in a state of decline. Some have become marshes due to the rapid settling of the bed. Bank erosion is one source of water pollution. These and other conditions are known to exist but exactly to what extent or with what degree of damage to surrounding territory, there is little or no record available.

For some time various state and governmental agencies have been anxious to have data regarding these conditions, but no funds have been available. It is the purpose of this study to provide the data and make as comprehensive a study of conditions as possible in order that a definite remedial plan can be made.

This problem is a large one and requires time. Fortunately the Highway Commission made accurate surveys of the lakes some fifteen years ago and these are being corrected for change since that time. Notations are being made as to sewage, source of pollution, suggested areas for dredging, shore protection and recreational possibilities. Work has been completed and contemplated as shown in Figure 1045-1.

There is local interest in dredging in the case of every lake. Some lakes have already had dredging of one kind or another and it is logical to assume that others will be improved in the near future. An intelligent estimate as to the amount and kind of work possible can be made from the data obtained and the surveys being made.

The fact that there is an urgent demand for information at several points makes this study the more worth while. A great deal has been accomplished in the short span of the project. At Waterloo where there is a serious flood menace the survey is nearly completed. There is considerable agitation for raising the Center Street Dam in Des Moines and a study of the effect of this is necessary and has been completed. (See Figure 1045-2)

It is proposed to follow these surveys with Civilian Construction Corps or transient camp construction crews. In this way immediate use of this project is to be made, thoroughly justifying the survey. Furthermore, accurate determination of the meander line must eventually be made in order to establish definitely the demarcation of State and private ownership along the meandered streams of the state.

So far in this report we have concerned ourselves with the various State Planning Board projects now under way. But there are other phases of the subject which deserve continuous attention and study. Much has been done in the past concerning water power studies and more or less attention has been given to drainage and irrigation. Recreation has received some thought but this particular phase is of far greater importance than has been attached to it in the days gone by. In the remainder of the paper, comment is made on these subjects.

# MEANDERED STREAM SURVEY

Fig. 1045-J

The river surveys are the chief concern of this study. Pertinent portions are surveyed by the plane table method with one foot contour intervals. The condition of the banks, stream bed, and surrounding territory is being noted. Soundings are made whenever necessary. The surveyed areas show complete topography, including buildings, fences, timber, cultivated land, bridges, roads, and railroads.

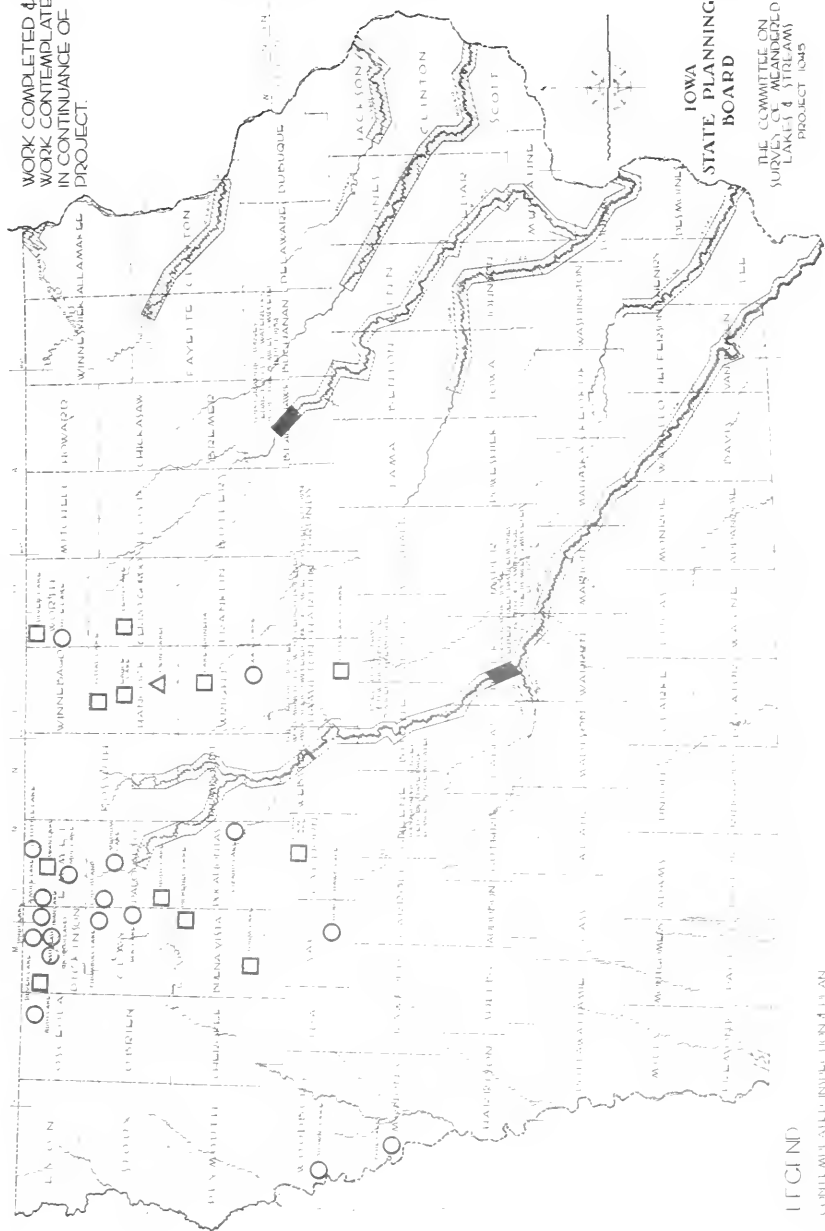
## IOWA STATE PLAN

# MEANDERED

# STREAM

# SURVEY

WORK COMPLETED &  
WORK CONTEMPLATED  
IN CONTINUANCE OF  
PROJECT.

IOWA  
STATE PLANNING  
BOARD

THE COMMITTEE ON  
SURVEY OF MEANDERED  
LAKES & STREAMS  
PROJECT 1045

1045-1



## WATER POWER

Iowa's rivers are a natural resource to be classed with its soil and minerals. As a source of water power they had a share in the pioneer development of the state. The trend from numerous small plants has been to centralization at the more favorable sites. Despite the abandonment of hundreds of old mill plants the total capacity of installed water wheels is larger at the present time than ever before in the history of the state. The major portion of the power is provided by the Keokuk development on the Mississippi River while the interior streams produce only approximately 16 per cent of the present developed power of Iowa. In 1924 the United States Geological Survey estimated the available horse-power as 400,000 with approximately 190,000 horse-power being developed at this time.

The power obtained from Iowa streams has characteristics similar to the stream flow. Iowa rivers are erratic, their flow varying between a devastating torrent during periods of heavy rainfall and a mere thread of water during the dry season. Hence, the best undeveloped water power possibilities are located principally on the larger streams in the eastern and northeastern portion of the state. The bulk of the potential power is located on the Iowa and Des Moines River systems, with a large amount of power, as yet undeveloped, represented in the Mississippi River, a favorable site being at Davenport.

In a paper by Floyd A. Nagler, "Water Power Development in Iowa," he states, "It is never feasible to develop all of the potential power of a stream, although to the layman, power from water has a peculiar fascination and it is generally considered to cost little or nothing. However, the

DES MOINES RIVER TOPOGRAPHIC SURVEY

Fig. 1045-2

This map shows a typical survey made by one of the parties. There are numerous locations in the state where such information has been needed in regard to studies being made on flood control, changes in streams, and where changes in present conditions have been contemplated.







development of water power usually involves the initial expenditure of more capital than is required for the development of the same amount of power generated from coal, or other fuel. With the present economic balance, many of Iowa's best potential power sites will remain undeveloped awaiting growth of an industrial market for additional power, an increase in the unit cost of fuel power or a decrease in constructing costs and land values which will reduce the annual cost of water power to a figure below the cost of producing the same power by fuel. . . The future probably will never witness the development of water power to its maximum extent, for water power is only one of many conflicting uses into which civilization may invest her water resources. In this connection, a survey of each stream will be very beneficial at this time in order to prevent its hazardous use. Such a survey would delegate to each section its type of future development which would insure the best use of the river as a whole."\*

#### DRAINAGE

Little study has been made of the effect of tile and open ditch drainage on stream flow and runoff. Opinion seems to indicate an equalizing effect between surface runoff and seepage flow giving no appreciable change in stream behavior when recent records are compared to those obtained subsequent to extensive drainage.

In this region, drainage was not extensive until the passage of the 1904 Drainage Law, but nearly all work was completed by 1917. The greater

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\* Floyd A. Nagler -- "Water Power Development in Iowa."

part of this compact area of drained Iowa land is in the upper portion of the drainage areas of the Des Moines and Iowa Rivers.

Proessors S. M. Woodward and F. A. Nagler in their paper, "The Effects of Agricultural Drainage upon Flood Runoff", state in the synopsis:

"A survey of completed drainage enterprises in the Upper Mississippi Valley indicated that a comparison of stream-flow conditions prior and subsequent to extensive drainage could best be made upon the Des Moines and Iowa Rivers, a large portion of the water-sheds of which have been covered with artificial drains subsequent to the establishment of stream gauging stations.

"A critical examination of the records of these two streams shows that during flood periods there has been no significant change in their behavior which may be attributed to drainage. The total runoff from storms of like precipitation, the maximum rates of discharge, and the rain-water storage conditions within the basins seem to have been unaltered by the extensive drainage operations. It is believed that if any of these factors had been changed by a measurable amount, such fact could easily have been detected by the analysis made in this paper.

"The drainage operations on the water-sheds of these two rivers involved the construction of tile drains, open ditches, and some straightening of stream channels, typical operations in drainage projects in the Upper Mississippi Valley. Since there has been no appreciable change in the runoff from these water-sheds which have experienced extensive drainage, it appears, therefore, that agricultural drainage has had a negligible effect upon the magnitude of either the total flow or the maximum discharge

of the floods of the Mississippi River, less than 5% of the water-shed of which has witnessed agricultural drainage operations.\*\*

It may be stated in this connection, however, that although total volumetric comparisons might indicate little change, nevertheless, Iowa streams in the drained area have a much flashier action than was existent before extensive drainage was completed. This may be more apparent when the studies in process are subjected to analysis with this in mind.

#### IRRIGATION

Irrigation has received little attention in Iowa due to what has generally been at least sufficient rainfall during the spring and summer months. Consideration of the capacity of the soils of the various water-sheds to receive and hold waters, the income possibilities from such waters and the return flows of waters placed in such reservoirs might well be a subject for future study. During the recent drouth years some thought is being given to the use of irrigation as a stabilizing influence.

Although it is generally believed that water levels are being progressively and permanently lowered because of deforestation, over-grazing, over-cultivation, over-drainage, etc., quantitative data in support of this belief are meager and inconclusive. This is a problem of great importance, for the permanency or intermittency of streams, stream flow in general, the permanency or intermittency of lakes, lake levels in general, the permanency or intermittency of common wells, and water supplies from common wells

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\* Sherman M. Woodward and Floyd A. Nagler -- "The Effect of Agricultural Drainage upon Flood Runoff."

in general are determined largely by ground-water levels.

#### NAVIGATION

Navigation by boat contributed an important role in the original settling of Iowa. As years passed this mode of travel gradually declined until many of our formerly prosperous river cities were reduced in importance. A general demand for rehabilitation resulted in the formation of the Mississippi Valley Association, uniting the efforts of millions of people in this great drainage basin concerned with a water connection to the sea.

The United States Engineers made exhaustive surveys of both the Mississippi and Missouri Rivers from the standpoint of providing permanent navigation channels. The program at present being carried on on the Missouri River provides for a six-foot channel from Kansas City to Sioux City, Iowa, obtained by dredging, straightening, and wing dam control. In years past the Missouri has been notorious for its channel instability, its shifting sand bars and extensive erosion of its banks by undercutting currents. Navigation on this river is paralyzed for from three to five months by ice and low water stages. Slack water navigation on the Mississippi from New Orleans to the Twin Cities will be accomplished by the provision of a nine-foot channel from St. Louis to St. Paul. This is to be done by canalization under the War Department. A large sum of money has been allotted to this work from Recovery Act funds with the purpose of speeding employment. The river is open to navigation throughout seven months of the year.

This has been of immense benefit to Iowa and should show an increasing value when river traffic assumes its former prominence.

Other Iowa streams have been investigated from this angle, namely, the Des Moines and Iowa Rivers. A plan is on foot to provide a series of low head dams on the Des Moines River making pleasure boat traffic feasible as far as Des Moines. The present transportation trend indicates that commercial use of interior streams for navigation would not be feasible and certainly would not be economical at the present time. Navigation of these streams would be of recreational value only.

#### RECREATION

The lakes in the northwestern part of the State are the most important recreational centers. These lakes provide fine bathing, boating, and fishing in the warmer months and fowl hunting in the winter. But these lakes are not centrally located and therefore are not available to a large majority of the people of this State. There is a decided need for other lake areas. Man-made they must be, but time will produce a natural setting. Through the efforts of the Civilian's Construction Corps a total of seven small lake developments have been completed and three others are now under construction. Other small lake developments at strategic locations would provide the citizens of the State with a number of convenient outdoor recreational areas which would be of far more social value than a single large lake development.

The rivers throughout the State offer recreational opportunities to a greater or less extent depending upon the use of the water by civil or private enterprises. In some future time when communities are not permitted to use the streams for sewage disposal and when private businesses do not

pollute the water with waste matter, the rivers of Iowa will provide a new opportunity for recreation. Both large and small streams can be stocked and boating will again be a pleasure. Rivers passing through towns and cities can be improved and will have added value, provided the necessary legislative action is taken.

#### CONCLUSION

In large part this is a progress report on the work instituted by the Iowa State Planning Board and, because of the unfinished state of many of these projects, it would be most difficult and likely impossible to draw meritorious conclusions at this time.

When this work was originated it was apparent that reliable data must be the foundation for any study of water resources. Although various agencies had been at work accumulating information over long periods in the past, this material was widely scattered throughout the State. Essential information was lacking and desired compilations had not been made, so it was first necessary to develop this type of data. Thus the Iowa State Planning Board has been responsible for the collection and assemblage, the bringing up to date, and the making available of scientific material necessary to any future plan or design. It must be remembered that this is not an end in itself; such work never ends; new problems arise and with the advance of knowledge and new applications of old facts the whole work must continue unceasingly.





LOWER DES MOINES RIVER VALLEY

Project 1054

PLANNING BOARD COMMITTEE

A. C. Trowbridge, State Geologist, Chairman, S. U. I., Iowa City  
H. H. Kildee, Dean of Agricultural Division, I. S. C., Ames  
P. F. Hopkins, Chief Engineer of P. W. A., Des Moines  
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COORDINATOR

Ralph F. Rogers, Burlington

## LOWER DES MOINES RIVER VALLEY

### Project 1054

At the inception of the various projects the problem of the Lower Des Moines River Valley was thought to be essentially a water development project. As the actual study continued it became apparent that it must also be treated as a land utilization problem.

The Lower Des Moines River Valley was settled in the early 1830's by a superior class of hardy pioneer stock from New York, Pennsylvania and Ohio, with a limited number from the south, and enjoyed, owing to navigation and local industries, a flourishing period of prosperity until about 1860-1865, when industrially, Van Buren county ranked twentieth in the state of Iowa. Since then there has been a steady decline in industry and population and the standard of living, especially in the broken regions adjacent to the Des Moines River.

This area presents an acute problem from the standpoint of soil conservation and rehabilitation of its population. The soil denuded of its native forest covering is subject to rapid erosion because of its steeply sloping character. In addition to the damage to this area itself, the erosion is threatening the good farm land which lies above it. Because this land will not provide a decent living for the people who till it, many families have been forced to seek assistance from the county relief organizations.

Project 1054 was an outgrowth of a hearing before the Iowa State Planning Board in Des Moines, June 5, 1934. The board had been approached by several organizations and individuals urging that something be done for

PICTURES 1054-A AND B

The sad story of what is happening where the natural timber has been cleared away and the destructive forces of erosion have made serious inroads.





this area. Following the hearing, the special committee was appointed by Chairman Kildee to proceed with the work on this area.

#### SUGGESTED APPROACHES TO THE PROBLEM

The Lower Des Moines River Project is both a water and soil conservation project. Much of the work that has been done previously in this area has been related to power development on the river. Following a meeting and field trip of the committee and technical advisors through the area on August 3 and 4, it was the consensus of the members that any particularly large power development should not be undertaken at this time.

The project might rather be considered as a

A. Long time forest project including

- (1) erosion control,
- (2) water conservation,
- (3) grazing (under forestry control);

B. Recreational reserve for boating, vacationing, etc.;

C. Fish and game development;

D. Part time employment possibility in

- (1) timber, nursery, planting, cutting, and in permanent saw mill,
- (2) also, miscellaneous industries such as willow furniture making and willow charcoal burning, wool weaving, ceramics, stone quarrying, and woodworking.

The committee passed the following resolution and instructed the coordinator to proceed with the necessary details for carrying on the work:

PICTURES 1054-C AND D

Winter views in the Lower Des Moines River Valley showing natural game cover. Under the proposed development such scenes will be common.







Resolution:

Whereas: It has been clearly demonstrated to the committee that the Lower Des Moines River Valley constitutes a problem area from the standpoint of erosion control, correct land use, and rehabilitation of the people who are unable, at present, to provide themselves with an adequate standard of living;

Whereas: It is the belief of this committee that the possibilities for the development, in this area, of valuable forest lands, recreation centers, and small handicraft industries, are good;

Therefore: Be it resolved that this committee recommends that active steps be taken in the direction of reforestation of the area involved, and for the development of said area along wild life, recreational, and industrial lines.

PRELIMINARY WORK

The proposed development, many features of which will be repeatable, consists of an area of approximately 20,000 acres of broken land and land embraced in recommended United States forested areas, most of the land of sub-marginal character lying along the Des Moines River from a point somewhat north of Keosauqua to the Lee County line, with a smaller area embracing the bluffs and very broken land to the south of the river.

A field survey has shown that on a total of 20,416 acres included in this area, there are only 72 families, a total of 270 persons, involved. Many of these people can be used on the area when the proposed development

PICTURE 1054-E

A view below Bentonsport showing sand bars and navigation hazards. This was once the center of a very fine trading district depending almost entirely on river traffic.

PICTURE 1054-F

A part of this area that has not been cleared of its natural covering of walnut, hickory, oak and undergrowth.





is in operation.

In connection with the acquisition and development of this area, the following definite steps have been taken:

1. On August 7, having been informed of the project under consideration by the Iowa State Planning Board, the Van Buren County Board of Supervisors adopted a resolution endorsing the acquisition of this proposed area as a national forest project. On August 8 a local committee was organized for the purpose of taking options on this land, a voluntary and non-profit-making enterprise, formed for the purpose of expediting the development.

2. The Emergency Relief Committee has been interested in the area and stands ready to establish a transient camp in the area when definite plans are available.

3. It is proposed to construct one or more low-head dams across the Des Moines River for the conservation of water, to provide recreational facilities, and to develop a limited amount of low grade power for permanent saw mills and woodworking plants to be used in connection with the forestry project. In this connection the city of Ottumwa has offered to give to the project three 225 K.V.A. and two 85 K.V.A. generators of the water wheel type. These generators have been replaced in Ottumwa by larger, more modern machinery, and can be had simply for the removal from the plant. This equipment is in good, workable condition.

4. A more detailed survey of the local resources, amount of emergency relief going to each family, and suitable location for the first dam are now

PICTURE 1054-G

A woodland pasture, overgrazed and practically useless for anything but restoration as a national forest.

PICTURE 1054-H

An old post card view of Bonaparte when it was the center of a prosperous woolen industry. Its population at that time was 1500, whereas today it is only a little over 50.







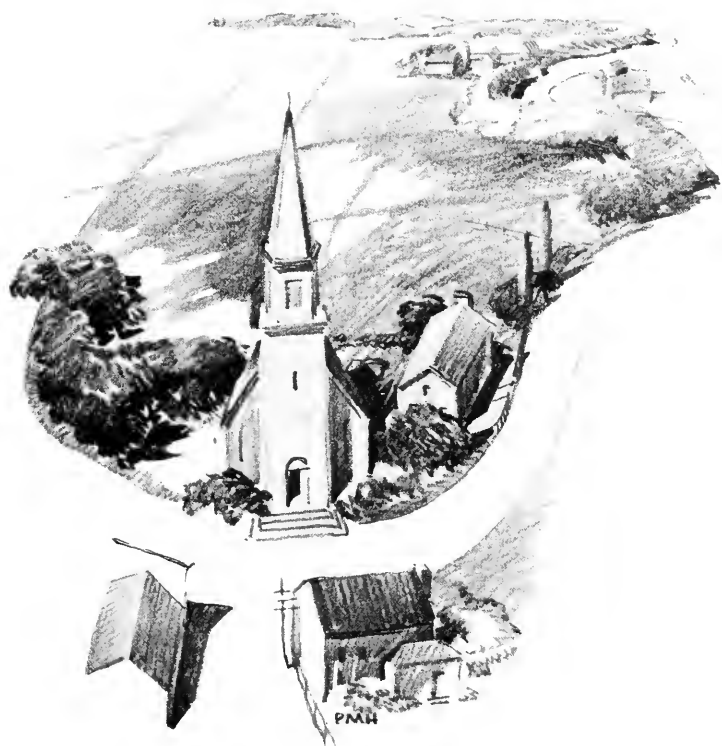
under way. Tentative design and plans for the dam are in process of preparation in the state E.C.W. office.

#### CONCLUSION

During the next year a very definite progress is expected toward rehabilitating this problem area, which represents one of the most completely depleted regions of the state. It may mark the definite beginning of the rebuilding and restoration to its rightful place of the whole Des Moines River valley, which for many years has been neglected, abused, and depleted until the river itself, in many places, is a silted, shallow, open sewer. Its once wooded hillsides are now barren and eroded and its once thriving population are in a deplorable state of want and distress.

The success of the Lower Des Moines River Valley project will be determined, to a certain extent, by the success of other Planning Board projects. Any recreational development in this area must be predicated upon the successful elimination of pollution, while permanent rehabilitation of the people will depend upon the successful establishment of new industries and sources of income.





PEOPLE

POPULATION AND SOCIAL TRENDS

Project 1048

PLANNING BOARD COMMITTEE

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Ray E. Wakeley, Ames

## INTRODUCTION

The purpose of the committee on population and social trends is to assist the development in Iowa of a civilization in line with the best American ideals. It is proposed to do this (1) by inventorying and describing the human and social resources of the state, indicating significant changes in amount, quality and distribution (2) by indicating certain liabilities--certain social problems that have arisen to limit the successful functioning of the social machinery--by showing where and how these problems have arisen and by showing how the problems may be solved.

Although interested especially in Iowa conditions and Iowa problems, the committee recognizes that these are vitally related to national and even international problems. Iowa can and should function more adequately both at home and abroad. The committee has collected certain data, both old and new, and has made such recommendations as seem justified by the facts.

Worthwhile results have been secured in each major field of study. The committee, however, was impressed from the beginning with the magnitude of the task before them. Very early it was decided that major emphasis at first would be given to studies of population; first, because it is basic to many of the other studies proposed; second, the census gives a more adequate factual basis for population analysis; third, facts about population are urgently needed by other committees on the State Planning Board. Other lines of investigation were not neglected and studies are now under way in six major divisions of the field.

None of these reports is complete, though the first is most nearly so. They are here presented to show the progress made to date. Plans for further investigation and recommendations for action are included when warranted by the facts.

### The Population of Iowa

Since the opening of Iowa Territory to settlement 100 years ago, the growth of Iowa has been quite rapid and continuous excepting the decade from 1900 to 1910 when Iowa lost in total population, largely because of migration out of the state, especially to the cities.

The settlement of Iowa by people from other states and from other lands, the direction taken by these waves of migration which have swept across the state, the changing characteristics of the population as settlement progressed and some of the factors, including the development of transportation, which have influenced the settlement and growth of Iowa, are clearly and graphically portrayed by Harter and Stewart.\* Further, they indicate that certain changes in structure, especially in age composition, follow the time of settlement; that is, the older the settlement, the larger the proportion of the population over 45 years of age. These older settled areas are largely the poorer land areas of the state. It is important to discover how much of the change is due to each of the various factors involved. In this connection the influence of the city should also be studied as well as the changes in agriculture.

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\* Harter and Stewart, "The Population of Iowa, Its Composition and Changes". Iowa Agricultural Experiment Station, Bulletin 275, 1930.



### Future Increase

The slowing down of population growth in Iowa raises serious question about the future population of the state. Two exceptional manuscripts, both of which are summarized briefly below, analyze past and present changes in detail and indicate what Iowa population is to be, if no outstanding changes take place in agricultural or industrial development and if the present national regulations are maintained against immigration. These studies show clearly that the people in Iowa are involuntarily engaged in a population reduction movement which may bring the growth of the state almost to a standstill in one generation. The full effect of population reduction is not noticeable at present because of the preponderance of the rural population and because the most striking reductions have been made so recently that they have not reduced the proportion of the female population in the child bearing ages. Iowa is face to face with the prospect of a stable population in which the number of births and the number of deaths will be approximately equal.

### THE GROWTH OF POPULATION IN IOWA\*

Iowa may never have a population of 3,000,000 and the year 2000 may find the total population of the state only slightly larger than at present.

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\* A condensed summary of the manuscript entitled, "Iowa's Population Prospects", written by P. K. Whelpton, member of the staff of the Scripps Foundation for Research in Population Problems. The manuscript will be published in full by the Iowa Agricultural Experiment Station as Research Bulletin 175.

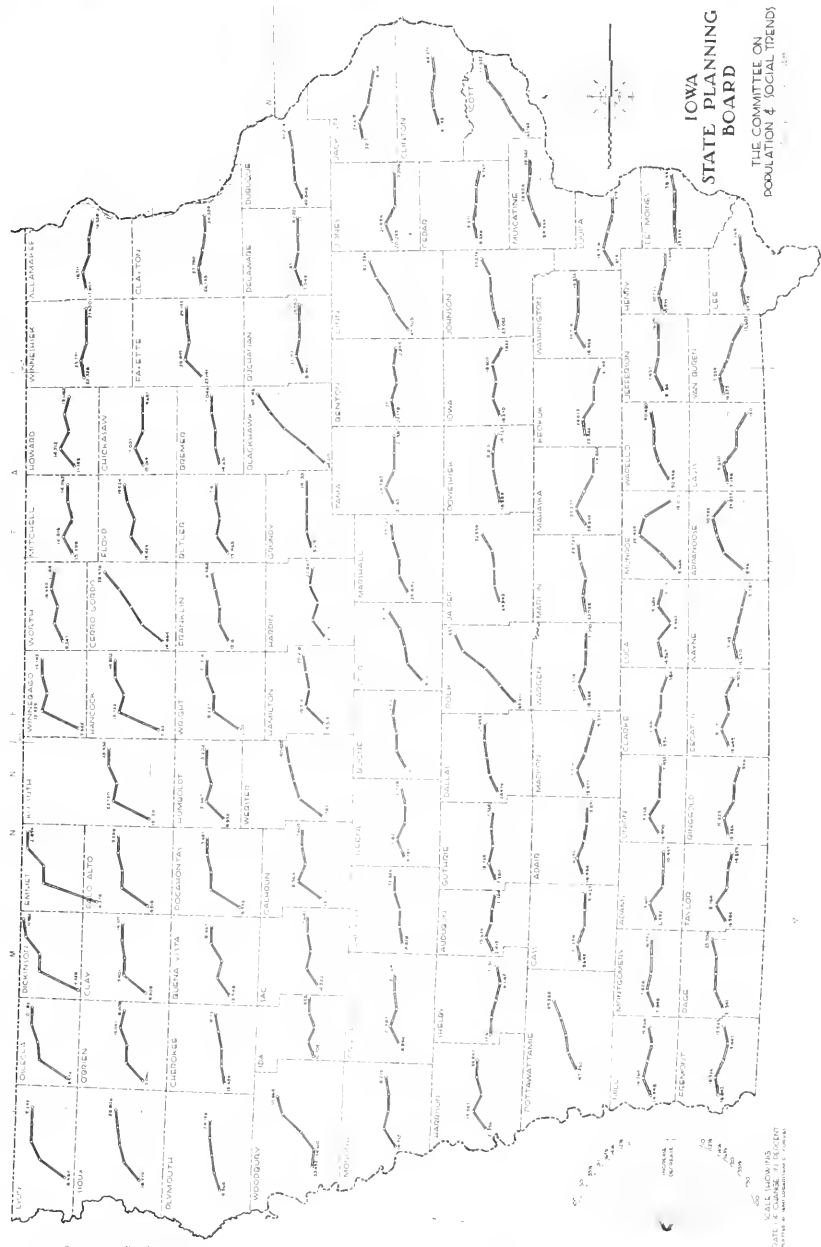
# RATE OF CHANGE OF IOWA POPULATION

Fig. 1048-1

The slower growth of Iowa population from 1890 to 1930 is not shared by all the counties. Urban counties, led by Black Hawk, Cerro Gordo and Polk, show steady increases, but in no county has there been any increase in the rate of growth.

Rural counties divide into two classes, eastern and southern counties have made only slight gains and in a number of these counties the population has decreased. Losses have been heaviest in the coal mining counties, some of which show gains followed by sharp declines. Counties in northwestern Iowa were settled later and increased rapidly until 1900. During the past 30 years they have increased much more slowly.

# IOWA STATE PLAN • RATE OF CHANGE OF IOWA POPULATION



IOWA  
STATE PLANNING  
BOARD  
THE COMMITTEE ON  
POPULATION & SOCIAL TRENDS



Present conditions indicate that the population of Iowa will reach its maximum number sometime between 1960 and 1980, probably about 1970. A conservative estimate places the population of Iowa in 1970 at 2,662,000 only 200,000 more than the present population of the state. The earlier the population reaches its maximum number the smaller the total number will be and, conversely, the later the maximum number is reached the larger the total number will be. That the population of Iowa is now approaching its maximum there can be little doubt and unless conditions change greatly the population of Iowa may decrease slightly for a time after the maximum number is reached. (See Figure 1048-1)

Change in the number of the population during any given period is the result of three important variables, the number of births, the number of deaths and the number of people moving into or out of the state. The prediction here made for Iowa is based upon an estimated probably decrease of 20 per cent in the birth rate, a five year average increase in population between 1930 and 1980.

#### Birth Rate Declines in Iowa

The birth rate in Iowa has declined constantly and will continue to decline for a generation. After that time it is expected that the number of births will become fairly constant. Urban growth and increasing industrial development, the decreasing number of rural population, the decreasing number of foreign born and increasing age of the population are the most important factors in lowering birth rates in Iowa. Past declines have resulted more from a decrease in the proportion of large families than from an increase in

the proportion of childless families. The decline in birth rates will not be as rapid in the future as it has been in the past. Probably by 1980 the rate for Iowa will be approximately 66 births per annum per 1000 women between the ages of 15 and 45 years. This is 20 per cent lower than the Iowa birth rate in 1930. (See Figure 1048-24)

#### Expectation of Life Shows Increase

The number of deaths in Iowa prior to 1924 is not recorded, but data for comparable areas indicate that death rates have been and still are decreasing. The rural death rate is lower than the urban rate for all age groups. As the death rate declines the expectation of life (the average number of years of life remaining for persons of any given age) increases. A considerable portion of the increased expectation of life may be attributed to the decreasing death rate for infants under one year old. Further increase in expectation of life will result from decreased infant mortality, increased control of disease, improved health conditions in cities and from the increase in the per cent of the population which is native born. During the next 50 years it is probable that the death rate for children under 5 years of age will be lowered 50 per cent, the rates for those between 25 and 45 years of age will be lowered 20 to 40 per cent, the rates for those between the ages of 45 and 75 years may be reduced by less than 10 per cent and the death rate for persons over 75 years of age will increase.

Birth rates have been falling faster than death rates. If these rates continue to fall during 1934 and 1935 at the same pace followed during 1930 to 1933, the population of Iowa will have a true rate of natural decrease

by 1935 and will not reproduce itself on a permanent basis thereafter. Some actual growth would occur for a few years because of the unusually large proportion of the present population in the productive ages.

#### Emigration Absorbs Natural Increase

Iowa's growth is affected greatly by the movement of the people across her boundaries. This movement varies greatly from year to year and there have been net movements into the state and out of it in different years. If the national government continues its policy of restricted immigration, Iowa, with no undeveloped resources to be tapped, little waterpower to be utilized and slight prospect of expanded industrial development in the near future, has little chance to increase her future population by means of immigration. In fact, during the next 50 years Iowa can expect to lose approximately 50 per cent of her natural increase in population by movement out of the state unless new types of farming, such as subsistence and part-time farming, are introduced on a scale much greater than is expected at present.

#### Population Changes Necessitate Careful Planning

The passing of one generation will bring Iowa face to face with the problems of a stationary population. Three classes of these problems should be mentioned. First, the changing age distribution of the population will decrease by one-third the proportion of the population under 20 years of age and double the proportion over 65 years of age by 1980. The decrease in children to be educated may be balanced by the greater need for adult education. Pensions or other means of caring for the aged will become increasingly important. However, the total number of dependent people, both old and

# COMPARATIVE POPULATION STUDY

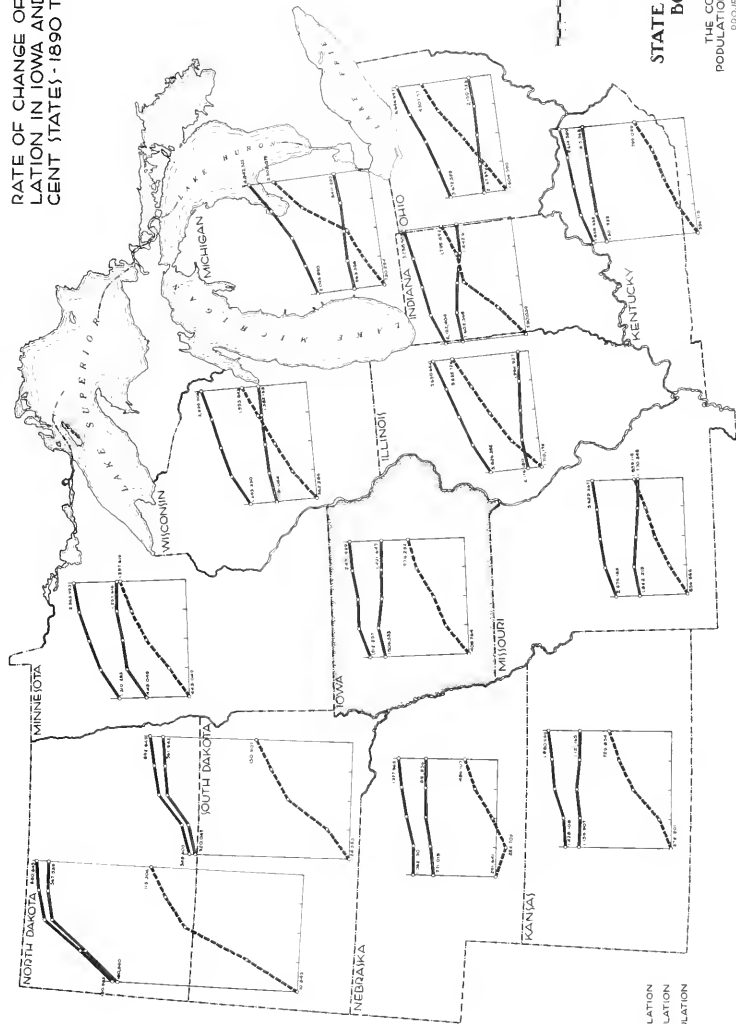
Fig. 1048-2

In every state the urban population increased more rapidly than the rural from 1890 to 1930. The urban population is increasing at a uniform rate both in the states where a majority of the population is rural and in the urban counties. In six states the urban population is larger than the rural. The rural population of Iowa has decreased slightly and four other states show similar declines. Iowa population is still predominantly rural, although the states north, east and south are predominantly urban.



# IOWA STATE PLAN • COMPARATIVE POPULATION STUDY •

RATE OF CHANGE OF POPULATION IN IOWA AND ADJACENT STATES - 1890 TO 1930.



## LEGEND

- TOTAL POPULATION
- - - RURAL POPULATION
- ... URBAN POPULATION

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young, is not likely to increase.

Second, a stationary population will bring greater stability, less movement of people from place to place, less emphasis upon numbers or size as a criterion of excellence and possibly more emphasis upon quality of population and equality of living.

Third, stationary population demands a stabilized agriculture. Land values rise less rapidly or not at all and there is less need for the exploitation of natural resources. Farmers can no longer depend upon a growing population to make agriculture profitable.

Some of the effects of slower growth and increased age of the population of Iowa may be harmful, particularly if not foreseen and discounted by a planned program. A stationary population may make planning more effective and play an important part in attaining higher planes of living.

#### THE FUTURE GROWTH OF IOWA FEMALE POPULATION\*

It is a well established fact that an excess of births over deaths and a birth-rate relatively high with respect to the death-rate may not be indicative of a population's reproductive vitality. A population may show an increase and still be threatened with an actual decline even though the same fertilities at which this increase is taking place should continue in the future. Births and deaths, and consequently birth-rates and death-rates, are a function not only of fertilities per se but also of the age composition

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\* See also Karpinos, Bernard D., "The Rate of True Natural Increase of Iowa Population". - State University of Iowa, thesis, 1932.

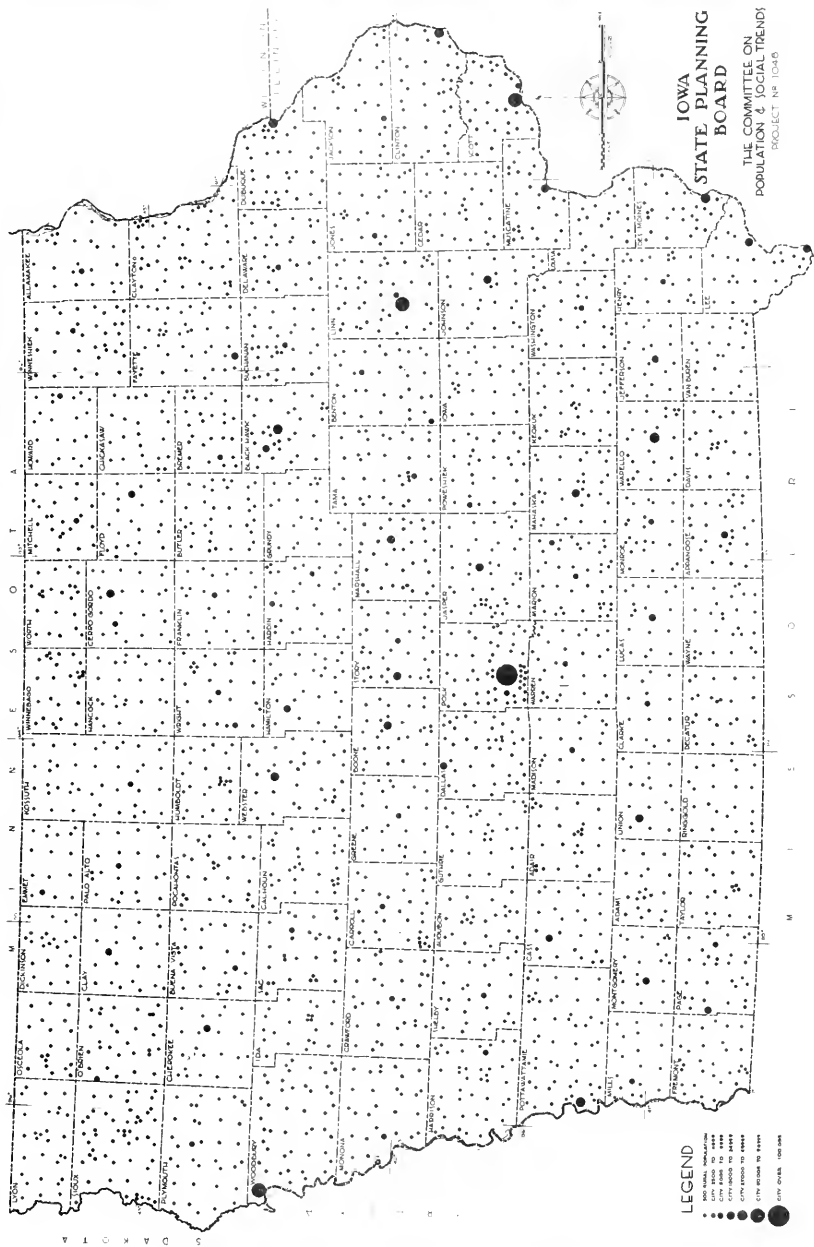
DISTRIBUTION OF IOWA POPULATION, 1930

Fig. 1048-3

The rural population, which is illustrated on this figure by townships, is very evenly distributed over the state. Cities are more numerous in the sections settled earlier and along the rivers. There has been no marked suburban movement except to one township south of Des Moines.

Iowa is a rural state with over 800 towns and villages widely scattered over the state. These towns and villages are service centers for the farming population. As farmers decrease in number, towns and villages experience difficulty in maintaining their positions.

# IOWA STATE PLAN • DISTRIBUTION OF IOWA POPULATION • 1930





of the population. A preponderance of persons in the middle-age groups, at which the fertility rates are high and the mortality rates low, will result in a larger number of births and a higher birth-rate and, correspondingly, a smaller number of deaths and lower death-rate, although the total fertilities may not be sufficient for the population to maintain itself. Evidently births and birth-rates and deaths and death-rates taken as they are without paying due attention to the age distribution of the population supply a misleading index for measuring the "true" natural increase of the population.

It is with this in mind that a study was undertaken to find the true rate of natural increase; that is, that rate at which the population will increase when, as will eventually occur, the irregularities of the age factors have been smoothed out. It is shown, that with the existing fertility and mortality rates of 1929, the Iowa population, when stabilized, will become stationary. The stabilization point may be reached in the fourth quarter of the present century. The calculations indicate that the birth-rate will become stabilized at 15.20, and the death rate at 15.16. On this basis, the future growth of Iowa female population was traced and the changes in the age structure shown.

Other results pertinent to the work of the State Planning Board include the following:

1. The total fertility of the Iowa population in 1929 was 110,580. This means that 100,000 potential mothers starting life together will be replaced within a generation by 110,580 potential mothers, provided

# DISTRIBUTION OF URBAN POPULATION

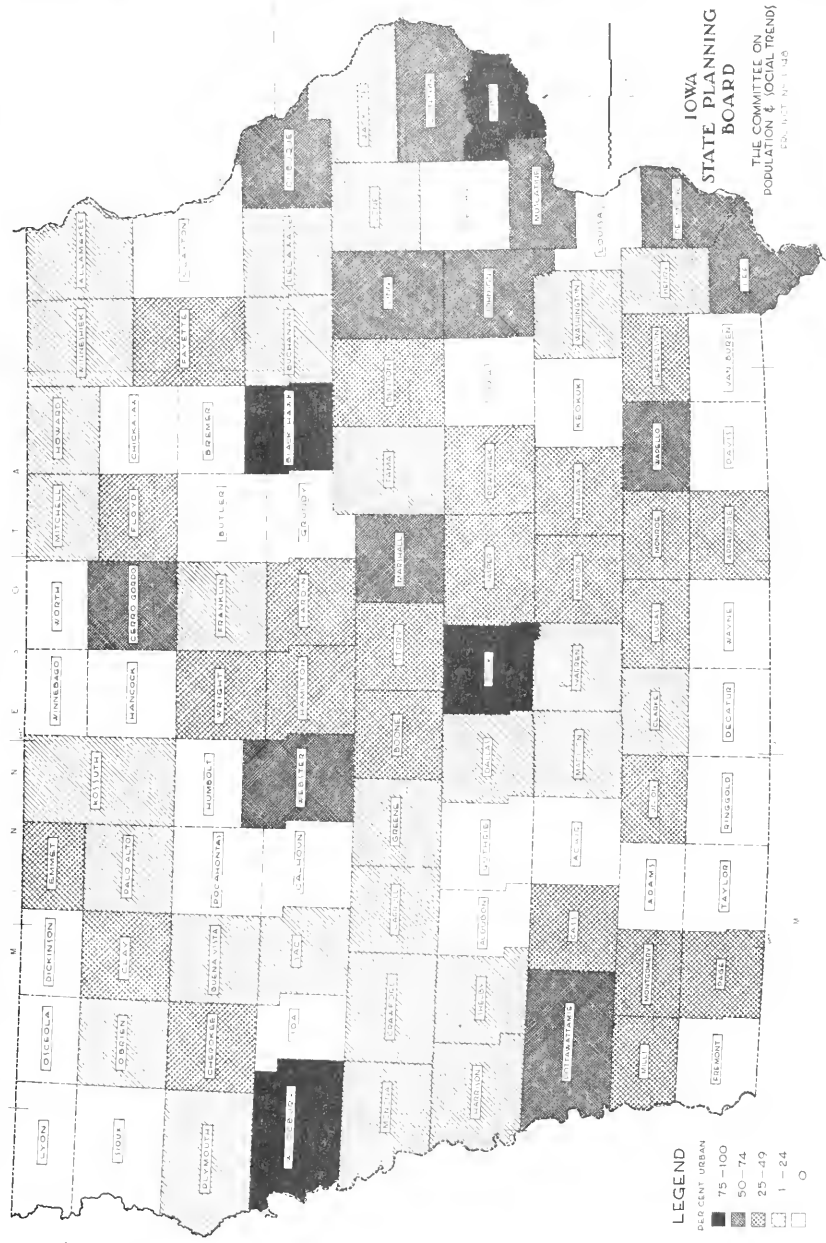
Fig. 1048-4

The population of Iowa in 1930 was approximately 40 per cent urban, 40 per cent rural farm and 20 per cent rural non-farm--largely town and village dwellers.

Sixteen counties each have more than 50 per cent of their population living in incorporated places of over 2500 population. Six of the urban counties border on the Mississippi and two on the Missouri River. Four counties, Woodbury, Polk, Black Hawk and Scott are over 75 per cent urban. Thirty-one counties have no town with 2500 or more population and so are considered entirely rural. These rural counties are distributed in all sections of the state.



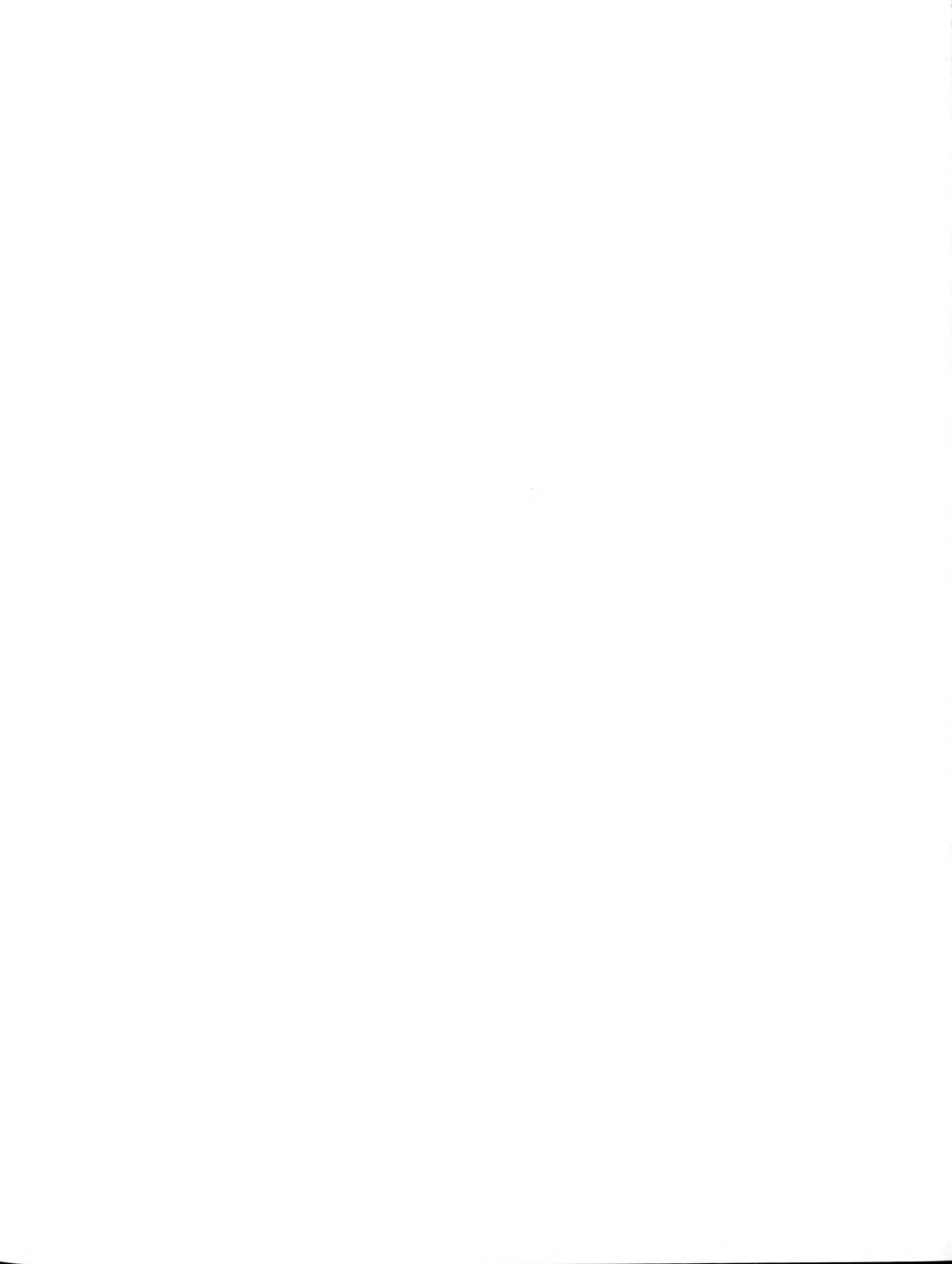
# IOWA STATE PLAN • DISTRIBUTION OF URBAN POPULATION •



**LEGEND**  
 PER CENT URBAN  
 75-100  
 50-74  
 25-49  
 1-24  
 0

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none of the former die before reaching the child-bearing period, or while passing through that period.

2. The net reproduction rate of Iowa at the fertility rates of 1929 and present mortality rates were computed to be 100,095, i.e.: 1,000 present mothers of such population are to be replaced by 1001 mothers within a generation (about 28.5 years).

3. The "true" natural increase of Iowa population, free from the factors that are responsible for the high proportionality in our reproductive age-groups, is .035 per thousand per annum instead of the observed 6.7.

It is at the estimated constant rate of .03 per thousand per annum that Iowa population will increase when it settles down to its fixed age-composition. It is a negligible increase, and Iowa population may then be regarded as stationary.

4. A birth-rate of 17.0 is necessary at the existing age-composition of our population to keep it stationary. The actual birth-rate for Iowa in 1929 was reported 17.1.

5. The calculations indicate that a birth-rate of 15.20 will ultimately take the place of the now existing birth-rate of 17.1, decreasing by 1.9, even though no changes in the fertility rates occur. A death-rate of 15.16 will replace our present death-rate of 10.4, increasing by 4.8, if no changes in the mortality rates take place.

6. The stabilization process will be about completed in the last quarter of the present century. It will take about two generations for the age-factors to settle down.

# ILLITERACY BY COUNTIES

Fig. 1048-5

Iowa, with only 0.8 per cent of its population illiterate in 1930, held first place among the states. Ida County is lowest in the state with 0.2 per cent and Appanoose County is highest with 2.2 per cent--just ten times as high as Ida. Mills County is high only when the 850 illiterate inmates of the state institution for feeble-minded children, located at Glenwood are included in the county total.

Twenty-two counties in Iowa have less than 0.5 per cent of their population over 10 years of age illiterate. Nine of these lowest counties are entirely rural. Six counties have more than 1.5 per cent of their population illiterate. Four of these are mining counties and none of the high counties is entirely rural. Urban counties hold an intermediate position, none of them being in either the high or the low group.

## IOWA STATE PLAN



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7. Our total population will increase ultimately to about 26 per cent above the 1930 level. This increase will be mostly concentrated in the age-groups of 40 and above. In fact, the group of under 20 years of age will decrease. When stabilized, this group will make up 96 per cent of what it was in 1930. The age-group of 20 to 39 will show an increase of 14 per cent, whereas the 40 to 59 group will rise about 50 per cent above 1930, the 60 to 79 group will more than double, and the 80 and above group will triple.

8. As the stabilization process goes on, great changes in the age-composition of our population will take place. When stabilized, our young group of under 20 will make up 28.6 per cent of the total population, a decline of 8.8 per cent as compared with the per cent of the same group in 1930. The 20 to 39 group will decline from 30.2 per cent in 1930 to 27.4. On the other hand, the proportions of the older age-group will be very much increased. In 1930, 21.4 per cent of the total population belonged to the 40 to 59 group. When stabilized, its percentage will rise to 24.8. The 60 to 79 group, which in 1930 constituted 10 per cent of the total population, will make up 16.7 per cent in the stable population. The 80 and above group will rise from one per cent in 1930 to more than two and one-half per cent.

#### Differences in Age Composition

While Whelpton stressed the changes which will take place in the age-composition of the population, Karpinos carried the analysis one step further. He shows the composition for the farm, rural non-farm and urban

# RURAL AND URBAN ILLITERACY

Fig. 1048-G

The rural non-farm population in Iowa had the highest percentages of illiteracy in 1930. This is due partly to the fact that this class includes most of the coal miners, and partly to the fact that the rural non-farm population has a higher percentage of old people. A combination of coal miners and old people in southeastern Iowa is associated with a high percentage of illiteracy. Absence of these factors in northwestern Iowa is associated with a low percentage of illiteracy. The differences between the farming population and the rural non-farm population suggest the advisability of separate analyses and treatments of these two classes of the population in Iowa.



# IOWA STATE PLAN

# RURAL & URBAN ILLITERACY

PERCENTAGES INCLUDE ALL ILLITERATES ABOVE 10 YEARS OF AGE, EXCEPT IN MILLS CO GLENWOOD, INSTITUTION FOR FEEBLE-MINDED CHILDREN, NUMBER 650 (ILLITERATE)

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## LEGEND

- LARGE NUMERALS INDICATE PERCENTAGE OF ILLITERATES
- WHITE BAR URBAN POPULATION
- HATCHED BAR RURAL FARM POPULATION
- SOLID BAR RURAL NON-FARM POPULATION

1048-6



population and indicates clearly the preponderance of children in the farming population and the preponderance of the younger middle-aged--the productive group--in the urban population.

The rural non-farm, the small town and village population with its high percentage of people over 45 years of age, is at the present time approaching the age structure of the stable population. This characteristic is clearly indicated by the following data which give the per cents of the various population classes in the various age groups.

Table 1048-A

Age-Composition of Iowa Population, 1930 and 1990

POPULATION CLASS	AGE COMPOSITION			
	0-19	20-44	45-64	65 and above
State Total, 1930	37.2	36.1	19.1	7.4
Urban	33.2	39.0	20.0	7.6
Rural Farm	43.7	35.3	16.8	4.5
Rural non-farm	33.7	32.4	21.3	12.5
State estimate, 1980 (Whelpton)	25.8	33.8	26.4	14.0

One further step in the analysis is to compare the age composition of the population in different sections of the state by counties or, better yet, by minor civil divisions. The following comparison of Davis County and Pocohontas County indicates that such an analysis will be most significant.

## RURAL FARM POPULATION

Fig. 1048-7

One of the most distinctive characteristics of Iowa farm population is its age. The distribution by broad age classes in 1930 indicates that Iowa farm people are young people. In the different counties, from 40 to 50 per cent of the farm population is under 20 years of age. In no county is the per cent between 20 and 44 years of age greater than that under 20. Another characteristic is the low percentage of old people on Iowa farms. In only 4 counties does the per cent of the farm population over 65 years of age equal or exceed the state average of 7.4.

These characteristics of the farm population are brought about largely by the migration of the young people from the farms, especially noticeable in southern and eastern Iowa, and by the retirement of older farmers, especially noticeable in northwestern Iowa. The distinctive differences are shown more clearly by comparison with figures 1048-8 and 1048-9.

# IOWA STATE PLAN

# FARM POPULATION

# POPULATION

DISTRIBUTION OF RURAL  
FARM POPULATION  
BY BROAD AGE GROUPS  
STATE AVERAGE 39.0

## LEGEND

- BROAD AGE GROUP
- 0 - 19
- 20 - 44
- 45 - 64
- 65 & OVER
- PERCENT FARM  
POPULATION PER  
COUNTY

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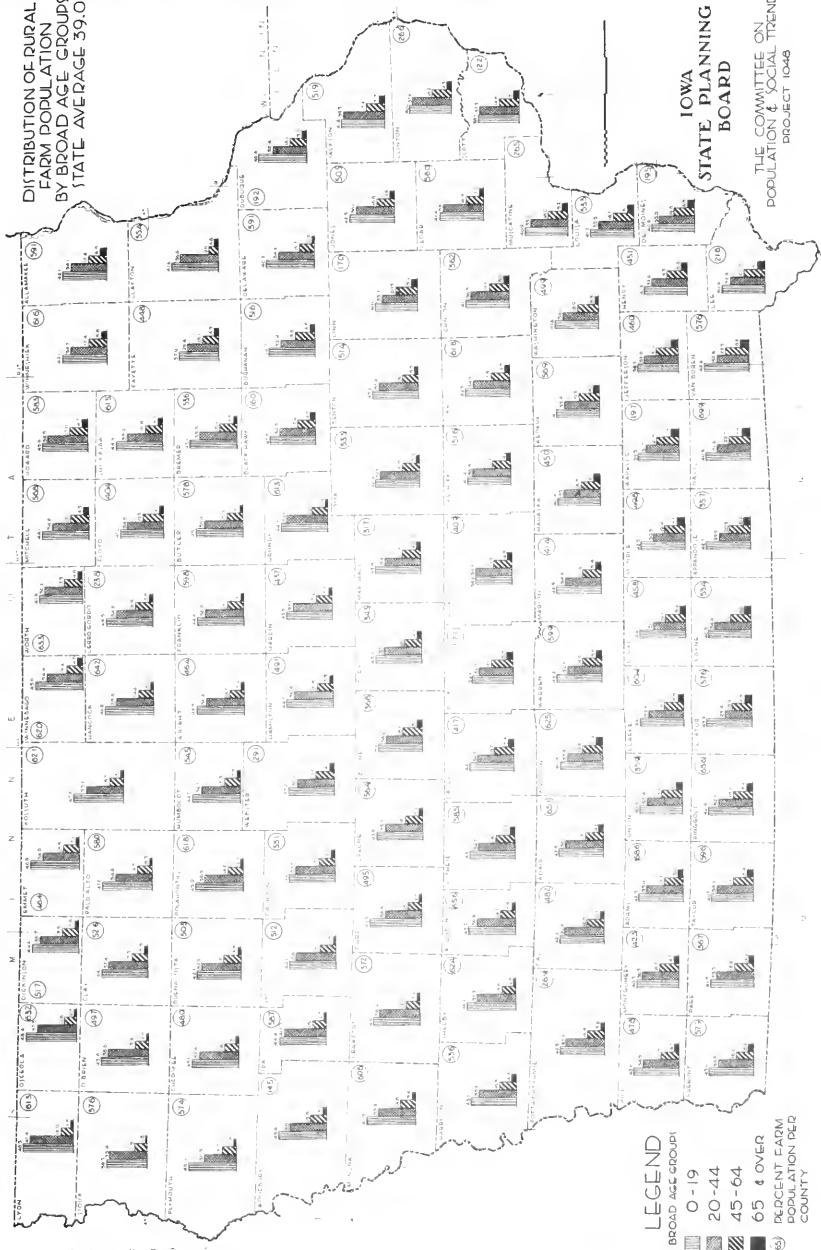




Table 1048-B

Age of Population in Davis and Pocohontas Counties, 1930

AGE (1930)	RURAL FARM POPULATION		RURAL NON-FARM POPULATION	
	Davis	Pocohontas	Davis	Pocohontas
0-19	40.5	45.9	30.6	34.9
20-44	31.5	36.5	31.6	34.2
45-64	20.1	14.5	21.5	20.0
65 and above	7.8	2.9	16.3	10.9

The data indicate that young people characterize the farming population while the old people are concentrated in the towns and villages. Davis County has a larger proportion of its population over 45 years of age both on the farms and in the villages. The very small proportion of the farm population of Pocohontas County over 65 years of age deserves special mention. The small proportion of the population between the ages of 20 and 45 is characteristic of both farm and non-farm population in both counties. Similar data for urban, farm and non-farm population of the state have been compiled by counties and are now being charted for use by the various committees. (See Figure 1048-7)

The analysis takes on added new significance because Davis County is in the southern tier of counties while Pocohontas is in the northwest cash grain area. The differences shown are again due largely to differences in settlement and to migration of the population. Persons over 45 years of age will largely determine the policies in Davis County and in the villages in Pocohontas County. The handicap to the younger group

comes not so much from their lack of numbers as from the fact that the leadership of the younger groups is frequently if not usually disrupted by the migration of young people from the area. Such movement is larger in Davis County and has been under way there for a longer time. The problems of social organization in this area will be set forth in some detail in this report under the heading of social rehabilitation.

#### Quality of the Population

The quality of a population is easily forgotten in a study of population growth. Quality, from the standpoint of both heredity and environment, is most important and must be maintained if civilization is to develop. Data here are meager but warrant further analysis.

Perhaps the most common measure of population quality is the percentage of the population 10 years of age or over who cannot read or write. Iowa stands highest, eight-tenths of one per cent illiterate, when rated by this measure. A further analysis by counties shows great variation. In general the south central and southeastern counties show the highest per cent of illiteracy, with illiteracy lower in every other section of the state and lowest of all in the northwestern part of the state. Analysis by population classes indicate that the rural non-farm group is highest in illiteracy, followed usually by the city. (See Figures 1048-5 and 6) The farming population has the lowest per cent of illiteracy of any class of population in Iowa.

#### Marital Status

Two very significant conclusions from Karpinos' report on marital



conditions in Iowa seem inescapable.\* First, there has been an increase in the per cent of the population married in each age group from 15 to 45 years. Second, the per cent married in the younger groups, 15-19 and 20-24, has increased rapidly since the beginning of the present century. (See Figure 1048-25)

The urban population leads the rural in the per cent of males married, up to 35 years of age, while the rural population has a higher per cent of females married at these younger ages. These differences are partly explained by the characteristics of the heavy migration which has been taking place in the rural population.

#### Migration

Migration of population into and out of Iowa has powerfully influenced the number and composition of the population. Iowa could not possibly have made such rapid growth previous to 1900 without large numbers of newcomers to the state. Likewise the population of Iowa could not have been checked so suddenly if large numbers of its people had not migrated from the state.

Summarizing, Karpinos says that about 160,000 more persons moved out of Iowa than moved into the state during the decade 1920-'30. This loss has not been distributed evenly over the state, for the rural population lost about 200,000 or one-fifth, while the urban gained 40,000 or one-tenth.

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\* See his report filed with the Planning Board.

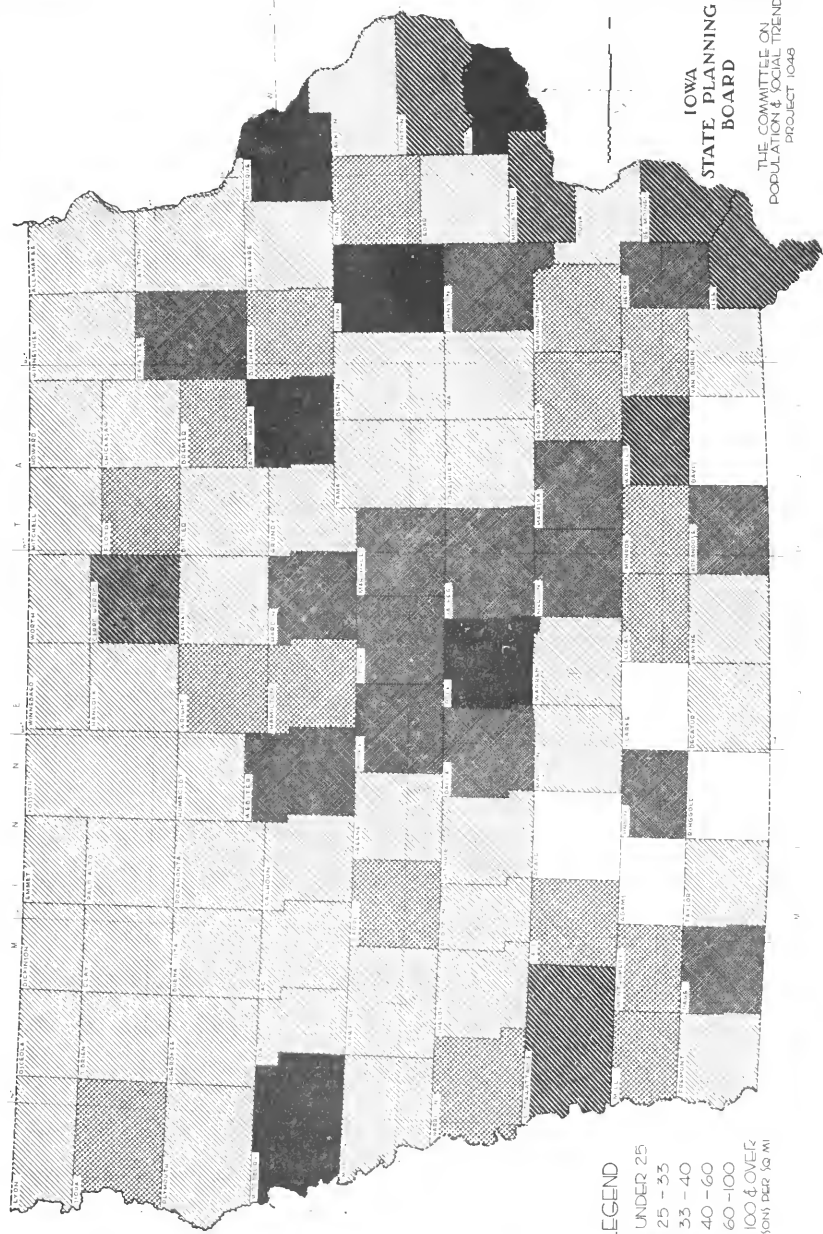
DENSITY OF IOWA POPULATION

Fig. 1048-10

The influence of the city does not markedly increase the population of the country surrounding it in Iowa. The density of population is affected by the city only in the county in which the city is located. In general the density of Iowa population follows very closely its urban distribution. Differences in density for rural population are not strikingly different or significant from county to county.

# IOWA STATE PLAN

## DENSITY OF POPULATION



### LEGEND

- UNDER 25
  - 25 - 33
  - 33 - 40
  - 40 - 60
  - 60 - 100
  - 100 & OVER
- PERSONS PER SQ. MI.

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Only 10 counties increased their population by migration. The greatest losses were sustained by the rural counties, especially the counties in southern and southeastern Iowa and the counties where the mining of coal has been decreasing.

The greatest bulk of the migrants from Iowa are young people, farm boys and girls. Beginning with the 15 to 19 age group, seven per cent of the boys and 20 per cent of the girls leave the farming population. Each age loses 20 per cent or more until age 35. No age group of the rural population gains through migration.

What is true of the farm population also holds for the rural non-farm population, with the exception that it is the young man in the rural non-farm group who leaves at an earlier age, whereas in the farm population the girls leave earlier. The urban population of Iowa showed increases due to migration for ages 10-30, but from that age and above cities also lose. The data indicate that the young men who migrate frequently leave the state directly while the females more frequently migrate to town or city where they live for a time and then leave the state.

#### Changes in Migration

The amount and direction of migration changes in response to changed social and economic conditions much more quickly and more completely than either birth rates or death rates. Changes in migration, therefore, as the principal factor in short-time population adjustment can quickly invalidate the best estimates of Iowa population. Since migration is the most difficult to predict it must be studied with care and estimated to date.

# FOREIGN WHITE STOCK

Fig. 1048-11

Here are included both the foreign born and the native born of foreign or mixed parentage. The highest percentages are found in northern and northwestern Iowa, where three counties have more than 50 per cent of the population in these classes. Germans constitute the largest proportion of the foreign born in Iowa, with about an equal number from other countries in northern Europe. In the northwestern counties, Hollanders predominate. Of the seven counties with less than 10 per cent of foreign stock, six are located in the southern tier.

The foreign born in Iowa are few in number and are decreasing quite rapidly. Their children, frequently considered foreign by their neighbors, still constitute an important part of the population of Iowa.

# IOWA STATE PLAN

## FOREIGN

## WHITE

## STOCK

PERCENT OF POPULATION  
WITH FOREIGN OR  
MIXED PARENTAGE

### LEGEND

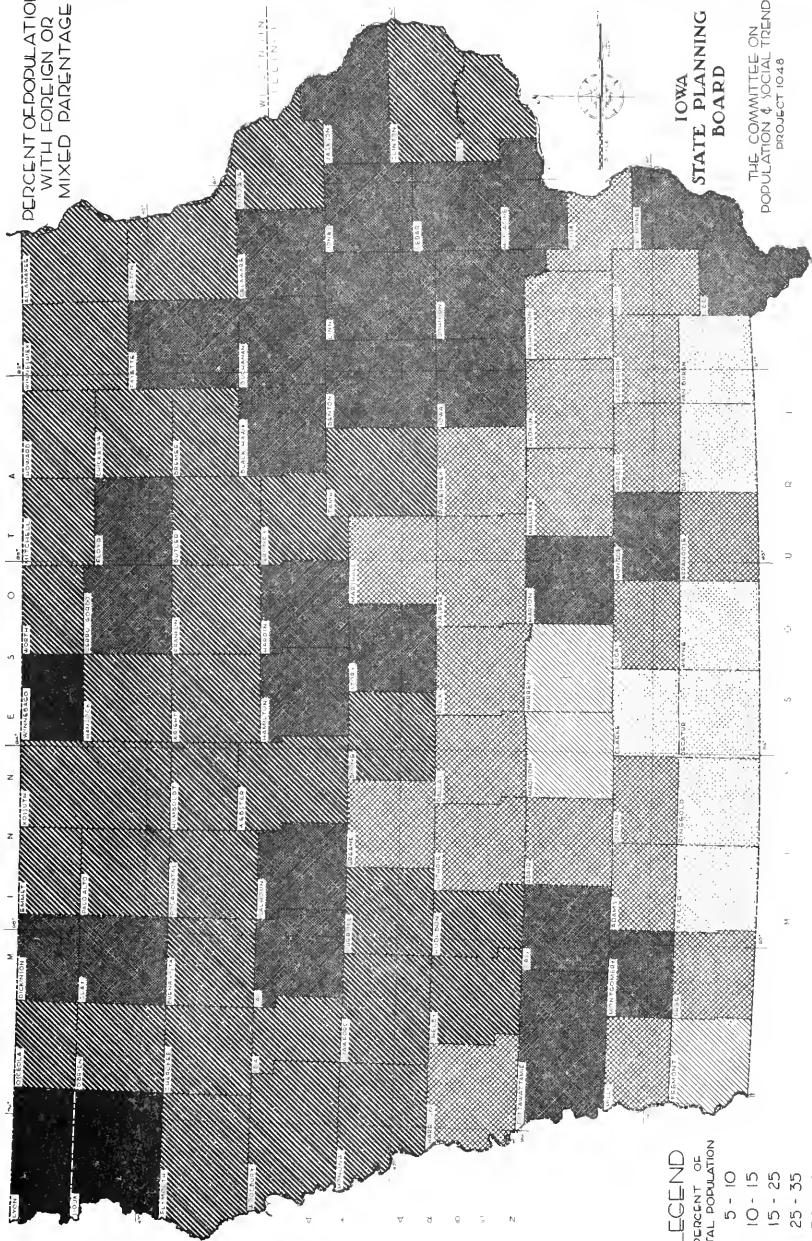
PERCENT OF  
TOTAL POPULATION

- 5 - 10
- 10 - 15
- 15 - 25
- 25 - 35
- 35 - 50
- 50 - OVER

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Evidence at hand in the annual estimates of farm population made by the Division of Farm Population and Rural Life in the Bureau of Agricultural Economics, at Washington, D. C., indicates that the movement of farm population in the North West Central States shows distinctive characteristics. In these states the farming population increased in 1933 and the size of the increase gave promise of a further increase in 1934. In these same states the number of children born in farm families increased 50 per cent from 1930 to 1933 and 30 per cent in 1933 over 1932. Young people many of whom migrated to out-of-state cities have returned. Meanwhile the normal movement from farm to city has not been resumed. Data for Iowa are not available but it is assumed that the movement of Iowa farming population would take a similar course.

Another change, mostly local in character, is the resumption of farming by former owner operators who retired too soon and who now force their tenants, frequently younger operators, off the farm and into town or village. These movements are changing the age distribution of urban, rural non-farm and farm population somewhat.

Drought conditions in the northwestern states and in southern Iowa are also changing the course of rural migration. Since a large part of the resulting migration will probably come into or through Iowa, this change is important. A preliminary investigation of the number and state-of-origin of farm operators coming into Iowa in 1934 was made by E. N. Duncan to show the size and results of this movement into Iowa. Further, he recorded the present location and occupation of the farm operators displaced by the newcomers, together with certain pertinent facts, showing the

POPULATION GROWTH, 1920-30

Fig. 1048-12

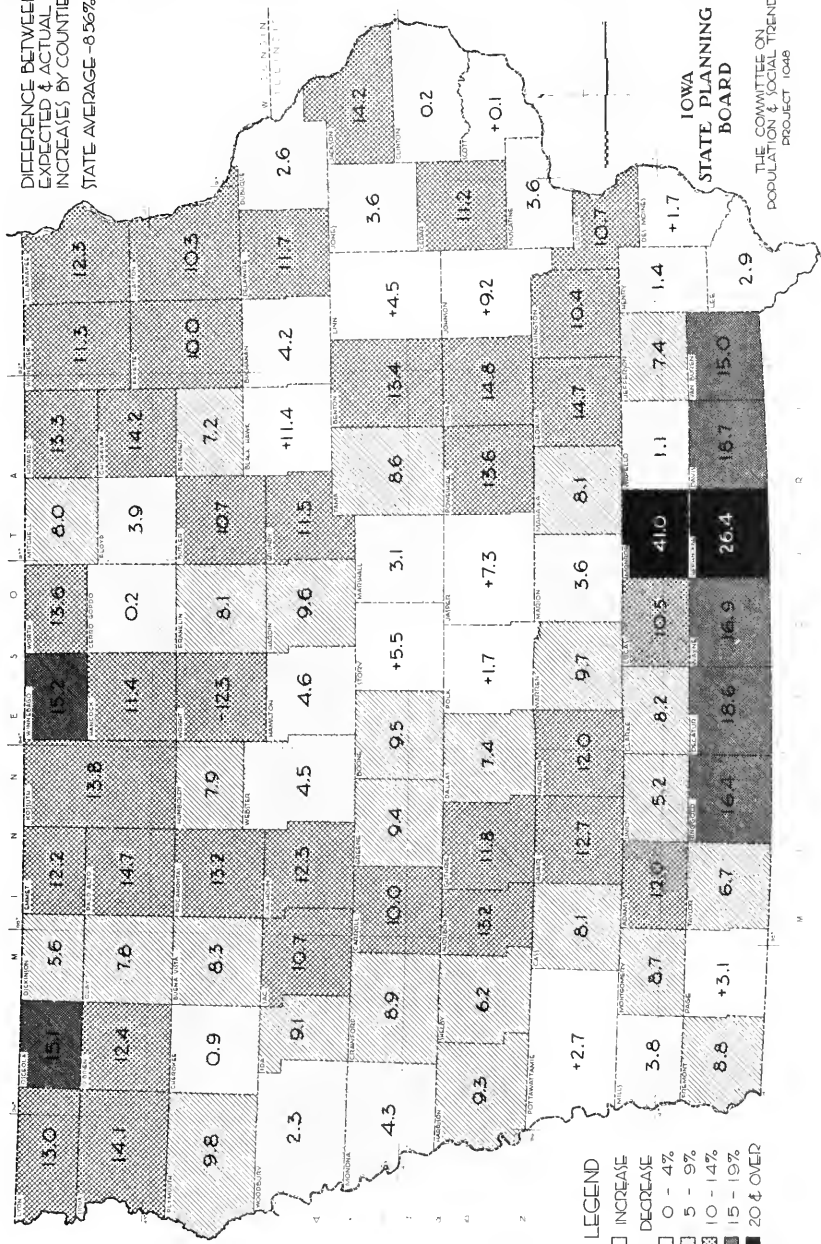
Here the actual population in 1930 is compared with the expected population, which is the 1920 population plus the computed natural increase to 1930, provided no one moved into or out of the county in question during the 10-year period.

Only 10 counties exceeded their expected population and seven of these are urban counties. Nine urban counties sustained losses. Losses were general in the rural counties, only 3 counties showing a gain, these being in the 25-49 per cent urban class.

Monroe and Appanoose Counties, both coal mining counties in the south central part of the state, were the heaviest losers, Monroe with 40 per cent below the expected. Seven counties, five of them in the southern tier, lost between 15 and 20 per cent each. While the population for the entire state in 1930 was 160,000 persons less than expected, this loss would have been greater by 40,000 if it had not been for the slight gains made by the cities during the 10-year period.

IOWA	STATE	PLAN	POPULATION	GROWTH	1920 ~ '30
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DIFFERENCE BETWEEN  
EXPECTED & ACTUAL  
INCREASES BY COUNTIES  
STATE AVERAGE -8.56%



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amount of intercounty movement by Iowa farmers.

The movement of farm families into Iowa in 1934 is quite generally distributed over the state but takes on serious proportions only in the northwestern part of the state and in certain other counties where unusual conditions prevail. Story, Boone, Cherokee, Sioux and Woodbury counties have 74 farm families who have migrated into these counties, four-fifths of them from North or South Dakota. Only 13 farm families have moved from these counties out of the state during the same time so it is evident that Iowa population is increasing from this source. If the present interchange continues, fifteen northwestern Iowa counties will gain between 700 and 1000 farm families between January 1, 1934 and January 1, 1936.

Drought, friends located in Iowa, and foreclosure are the most frequently given reasons for coming to Iowa. The newcomers displace other operators who must seek some new adjustment. Of 185 farm operators displaced by a total of 216 incoming families from other counties or other states, 94 are farming (13 owners, 80 renters and one manager) 42 are farm laborers, 43 are doing other work than farming—mostly odd jobs, two are not working and the occupation of four is unknown. A majority of all these families will be on relief this winter.

This increase in the farm and the rural non-farm population of Iowa, coupled with the growth of garden farming, dealt with under "Land Utilization", is increasing the demand for farms and creating a pressure toward reduction of acreage per farm. Lack of farm dwellings and sentiment against small farms has checked the movement temporarily.

# RURAL-URBAN GROWTH, 1920-1930

Fig. 1048-13

Comparison of the actual population in 1930 with the expected population, based on 1920 plus the natural increase, shows that all but two Iowa cities made gains through immigration during the decade. On the other hand, the other population in these same counties was less than the expected in all but two counties. In five counties the city gains were not large enough to offset the loss in the other portions of the county population. In 10 counties the urban gains were large enough to increase the county population above the expected. Readers should refer to the caption for Figure 1048-12. Also compare the expected increase with the actual increase shown in Figure 1048-1.







Table 1048-C

Families Moving Into Des Moines, 1933-34

Month	Families moving into Des Moines		
	1933	1934	From out of state, 1934
<u>Total, first 6 months</u>	353	434	201
January	38	53	26
February	54	58	33
March	60	70	25
April	60	67	23
May	71	84	40
June	70	102	54
July	33	77	44
August	54		
September	79		
October	95		
November	88		
December	47		

It seems more than likely that Iowa population is increasing at the present time through migration. The economic and social welfare implications of such an increase warrant most careful study and more than justify a continuation of the present survey.

#### RECOMMENDATIONS

- 1, Further localization of population problems should be accomplish-

# FARMS WITH AUTOMOBILES

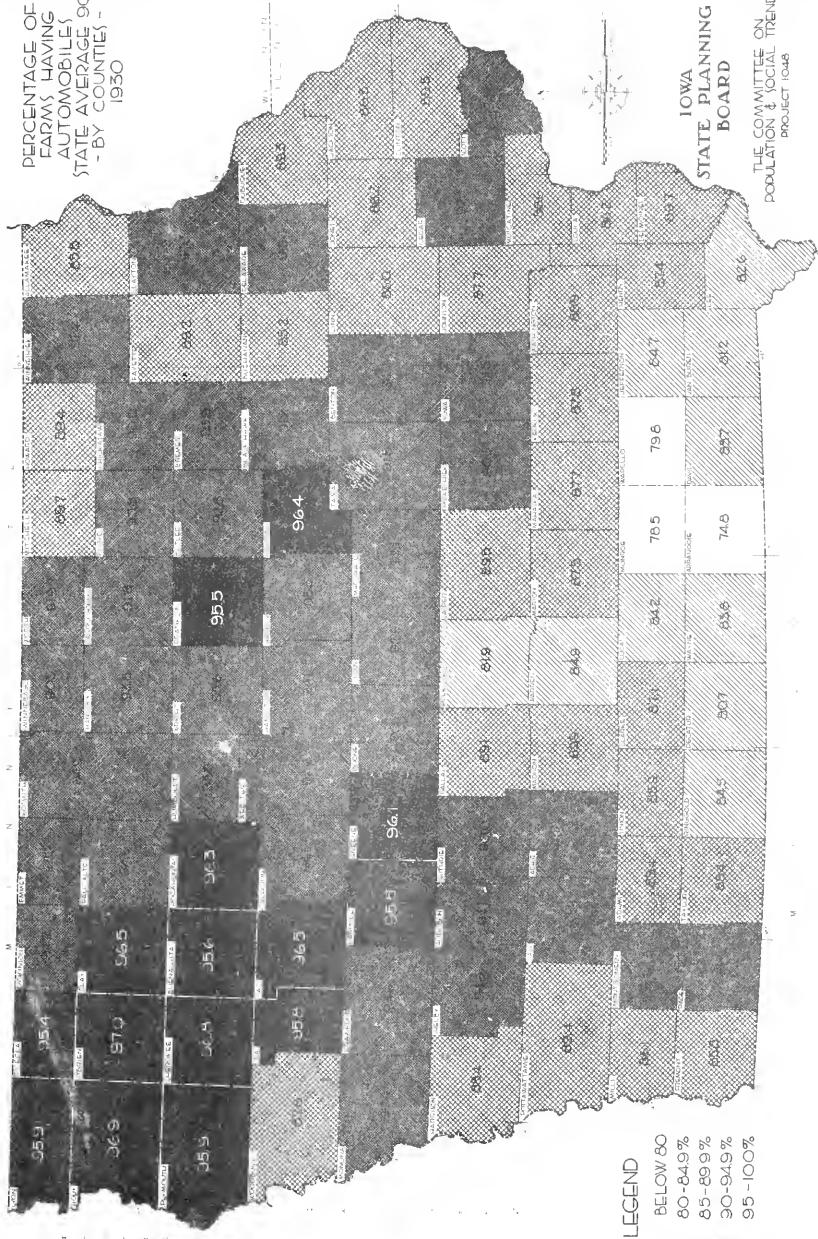
Fig. 1048-14

Iowa ranks high in number of automobiles, with cars on 90 per cent of the farms in the state. Thirteen counties in northwestern Iowa rank highest in percentage of farms with automobiles. The percentage is lower in counties to the east and south. The southern counties are lowest, with automobiles on three-fourths of the farms in Appanoose County.

Automobiles are more widely used by Iowa farmers than any other convenience studied. Automobiles are sometimes used in lieu of telephone, and in time of depression its use declines less rapidly than that of the radio. The automobile is considered an important necessity by Iowa farmers.

## IOWA STATE PLAN

PERCENTAGE OF  
FARMS HAVING  
AUTOMOBILES  
STATE AVERAGE 90  
- BY COUNTIES -  
1930

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ed by the further subdivision of available pertinent data and by classification on the basis of minor civil divisions. In this work the various classes of the population should be retained in so far as practical and in so far as further subdivision will aid in defining their character, composition and behavior or aid in the solution of local problems.

2. Population data should be combined in such a way as to define and characterize any significant population areas with common characteristics, or any gradient with respect to population growth and development. Population data should also be combined to assist in describing recreation areas, soil type areas, forest areas, erosion areas, land use areas, trade and other functional areas; in fact, any area which constitutes a problem for consideration by the State Planning Board.

3. Some means should be established in Iowa for regular annual measurement of population movement, both intra-state and inter-state. It is recommended that a permanent cooperative state-federal arrangement be set up preferably with the Division of Farm Population and Rural Life or perhaps with the Bureau of Crop Estimates for such an annual estimate. The objectives of such an investigation would be to determine the annual net gain or loss in Iowa population through migration, to find how these gains or losses are apportioned by localities, to discover the effect of migration on urban, farm and rural non-farm classes, and to determine how migration affects the general composition or structure of the population.

4. Serious consideration must be given to maintaining and improving the quality of Iowa population. This committee should institute a study, explorative in character, to discover sources of pertinent data and to deter-

## FARMS WITH ELECTRICITY

Fig. 1048-15

One-fifth of the farms in Iowa were lighted by electricity in 1930. Polk County was highest with 41 per cent. The most general use of electricity centers in a group of counties extending from O'Brien and Sac in the western part of the state across the central part of the state eastward to Benton and Scott, then southward to include Des Moines County. Five of the seven lowest counties are in southern Iowa.

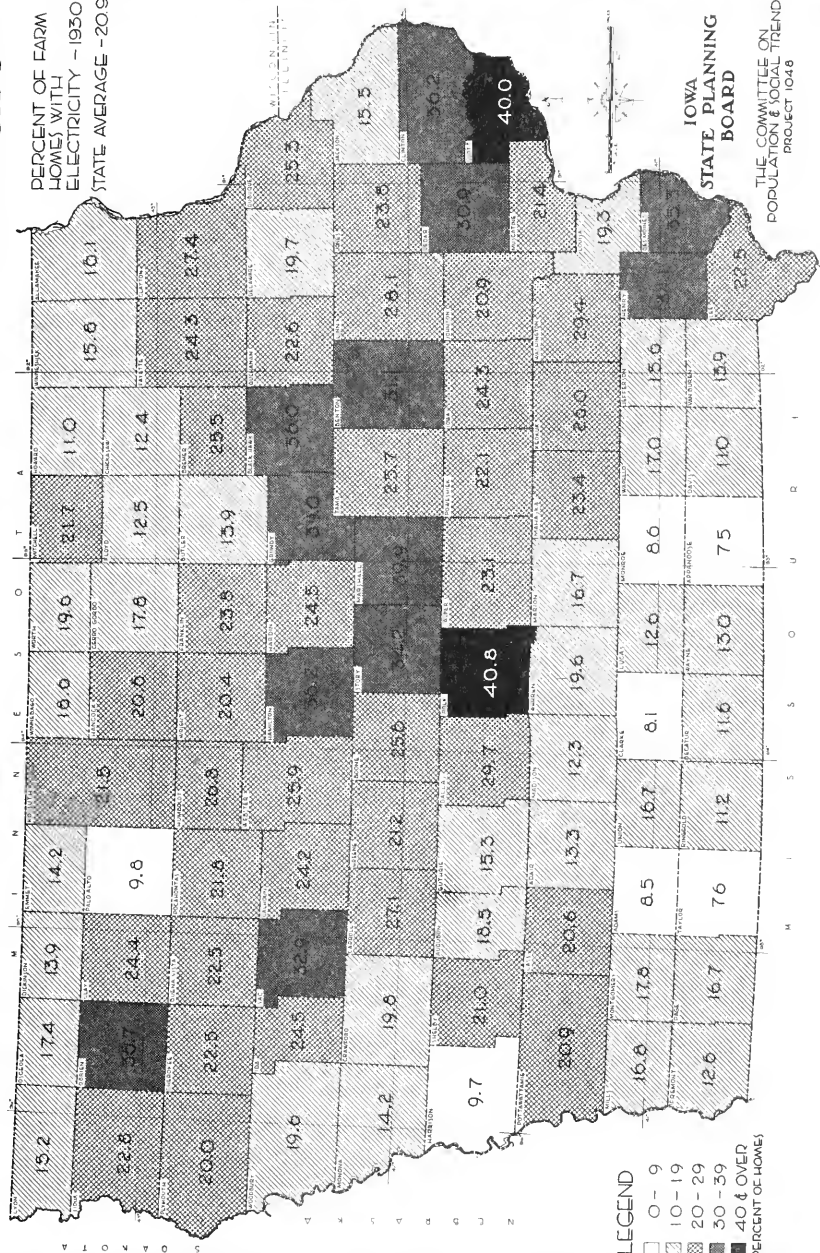
Electricity is the least widely distributed of any of the conveniences studied. Distance to a high tension line and the rates charged for current and service, together with economic status, are important factors which influence the use of electricity. No county in the state has one-half the farms lighted by electricity.

# IOWA STATE PLAN

## FARMS WITH ELECTRICITY

## PERCENT OF FARMS WITH ELECTRICITY - 1930

STATE AVERAGE - 20.9%



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1048-15





mine upon and institute such studies as seem warranted. In this connection the work already done in health and housing, in education, crime, labor, social work and rehabilitation should be fully utilized. Programs for land use, industrial development, and others should be scrutinized to determine their effect on the quality of Iowa population. Both eugenic and euthehic aspects of the problem should be considered. Legislation and educational campaigns should both be used to call popular attention to these problems and to bring about their satisfactory solution.

5. The reasons for changes in migration and in other population factors should be studied. Migration studies should be closely related to land utilization, housing needs, business and industrial development and requirements for relief.

6. Widest possible dissemination of the findings on population should be made, both to other committees and agencies and to the public. In addition to other means in prospect, it would seem wise for the Agricultural Extension Department of Iowa State College to publish a bulletin in the near future to bring the most pertinent facts home to the people of the state.

#### Facilities for Living

Certain facilities for living: the automobile, the radio, the telephone, running water in the house and electric light, have been quite commonly accepted as rough measures of the scale of living, especially for farm people. Because they have been so accepted and because they are included in the census enumeration, the committee has mapped the prevalence of these conveniences by counties as a further aid in defining and

## FARMS WITH WATER SYSTEMS

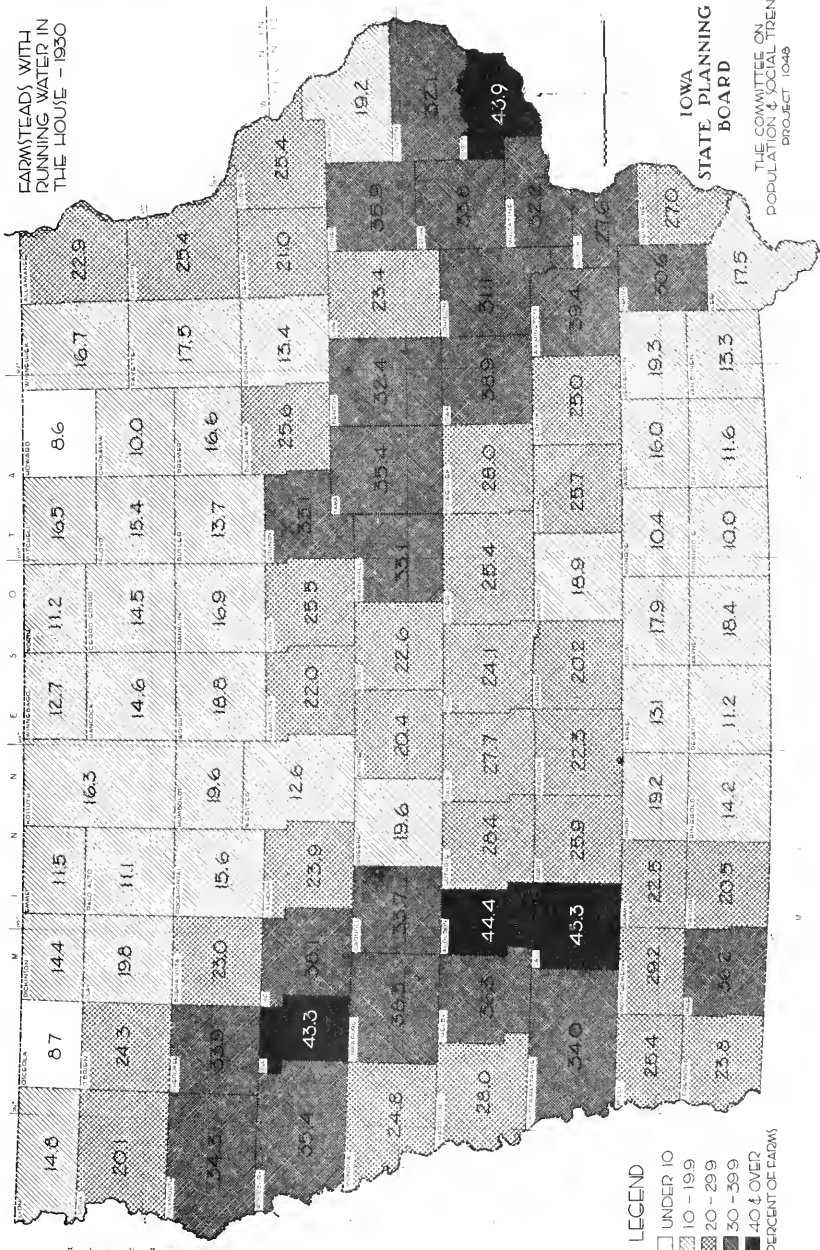
Fig. 1048-16

Running water in the houses, with 23.5 per cent of farm homes having this convenience, ranks slightly above electricity on Iowa farms. It is found most frequently on farms in west central and east central counties. It is least frequently found in northern and southern counties east of Taylor.

The negative relationship between high per cent of tenacy in northwestern Iowa, tax delinquency in both northern and southern Iowa, and the presence of electric light and running water, is very noticeable.

## IOWA STATE PLAN

## FARMSTEADS WITH RUNNING WATER IN THE HOUSE - 1930



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describing significant areas within the state.

The distribution of each of these conveniences, three of which are also important means of communication, show some variations but on the whole the distribution of any one is so similar to the others that a simple score has been devised for all of them by combining the class ranking of all five conveniences in any given county. Inspection of the scores by counties shows the lowest scores in the southern counties, the next lowest scores in certain eastern counties and in the counties in the two northernmost tiers, while the highest scores are in the central Iowa counties with their peak in the west central area of the state.

Small farms, poor soil, mortgaged farms, poorly furnished homes, lack of availability of the convenience itself and a general low standard of living are closely associated with the absence of these modern conveniences. A real challenge is presented by the fact that so many homes are without one or more of them even in the high-ranking sections of the state. Good living in any modern sense can scarcely be attained without them.

The value of dwellings per farm as computed by counties follows the same general pattern as the convenience scores. When these data are shown by townships, much wider variations occur. Burrell Township in Decatur County is lowest with an average dwelling value of \$785 per farm. Grand Meadow Township in Clayton County is highest with an average of \$4479. Both of these are strictly farming townships. The variation in value is more than 500 per cent. These data should find wide use in determining the characteristics and the needs of the various areas in the state.

# FARMS WITH TELEPHONES

Fig. 1048-17

With 84 per cent of the farms having telephone service in 1930, this service ranks next to the automobile as a convenience. Telephone service ranks highest in an area extending north and south from Cherokee County to Page, east through the central part of the state, then southeast along the Mississippi River. Monroe, Appanoose and Decatur Counties are lowest, Decatur with telephones on 62 per cent of the farms. Farms in certain urban counties, especially Woodbury, Polk and Dubuque, are low, with less than three-fourths of the farms having telephone service. The influence of farmers' cooperative telephone service is noticeably favorable to the more general use of the telephone. Davis County is above the average with telephones on 88 per cent of the farms. Farm lines are numerous in Davis County.

## IOWA STATE PLAN

STATE AVERAGE -84%

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Use should be made of studies of rural living in Iowa by Von Tungeln and by Hoyt. These studies give data on standards and scales of living in central Iowa counties before the depression. The rural and village housing surveys in 10 counties and the urban housing survey should yield valuable data for 1933 and 1934. The work of the committees on health, education, zoning and planning, transportation and rural public service should be carefully scanned for additional data which will be helpful in describing culture levels, high spots and deficiencies in the various areas. Some of the very best information on the results of the depression should be secured from the complete rural surveys of relief and near-relief cases supervised by Von Tungeln and made cooperatively by F.E.R.A. and Iowa E.R.A. in Poweshiek, Jasper, Wright, and Franklin counties in 1933-34. Project 1032 gives worthwhile data on the home conveniences of garden farmers in Iowa.

#### Recommendations

1. Complete the present analysis for urban, village and farm populations including, in so far as possible, the effects of depression and recovery to date.
2. Investigate the present availability of home conveniences in terms of proximity to the consumer and comparative consumer cost; (a) for rural and urban service, (b) for cooperative and public or private service. Also study the influence of local organization and initiative and personal desire on the spread of facilities for living.
3. Investigate post office and library service specifically.

# FARMS WITH RADIOS, 1930

Fig. 1048-18

Half the farms in Iowa had radios in 1930. The variation between counties was striking, with two-thirds of the farms in Montgomery and Carroll Counties, and less than one-third in Appanoose, having this convenience. Here again the highest use is in the counties extending from Page County directly north across the state to Dickinson. Several eastern counties also are high, but in general radios on farms are less common toward the eastern part of the state and least in number in the south. Availability of electricity is a factor influencing the use of radios on farms in a positive way.





(a) Locate Iowa post offices, indicate the class of service rendered by each and map all rural delivery routes. (b) Show the amount and kind of public library service available in urban and rural areas. (c) Prepare a plan for effective public support of libraries and for the extension of their service in areas where adequate service is not available.

### Iowa Income

Income is a measure of economic welfare and the chief criterion of economic progress. The source of potential purchasing power, it also indicates potential markets.

Iowa income has not kept pace with national income since 1920 because of the depression in agricultural income which has affected Iowa income almost from the close of the World War. Agriculture, mining, banking, finance and insurance have not again reached their wartime peak in Iowa while the income to each of the other broad classes of industries has gone beyond it.

Building construction has shown the most variable income while mining has declined most. The income to government, expanded during the war and relatively stationary since, has tended to increase since 1929. Manufacturing, transportation, banking, finance and insurance, and trade, both retail and wholesale, have accounted generally for an increasing proportion of Iowa income. Electric power, telephone and telegraph have shown increasing income throughout the period to 1929 and have declined only slightly since. Personal service has expanded and now has an income equal to that for agriculture.

Income as used here included income to both labor and property. The

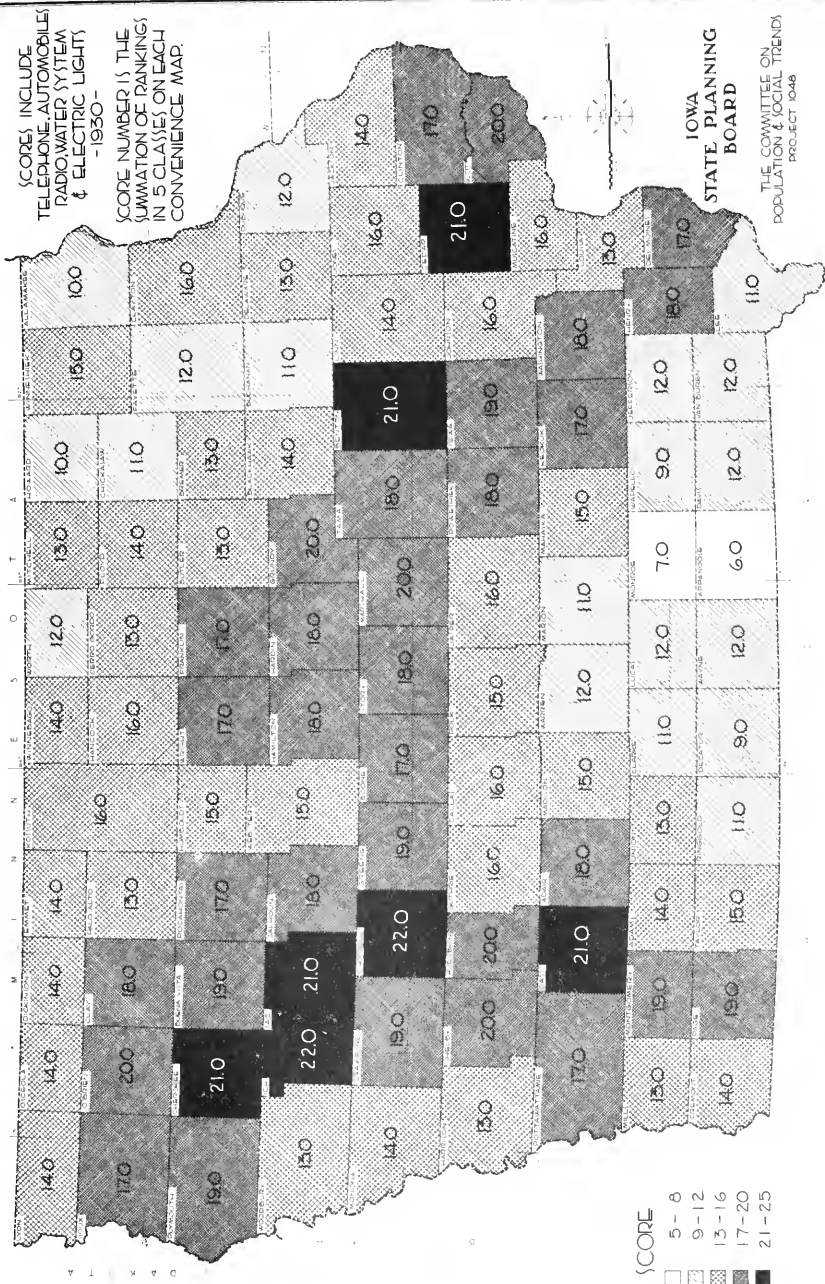
# FARM HOME CONVENIENCES

Fig. 1048-19

Observation of the preceding figures shows the striking similarity in the pattern of the distribution of home conveniences of Iowa farms. This figure shows the total score, by counties, for the following conveniences: automobile, electric lights, radio, running water in the house, and telephone. The score is a combination of the class rank, from 1 to 5 for each convenience, the lowest possible score being 5 and the highest, 25.

Rural counties are highest in home conveniences. Farms in no urban county rank in the highest class. Home conveniences are most common in the counties extending from Page County north to Cherokee, then south-eastward across the state through central Iowa. Southern counties are lowest and northern counties next to the lowest.

# IOWA STATE PLAN FARM HOME CONVENIENCES







portion of the total income paid to workers as salaries and wages has increased from 39 per cent to 52 per cent during the last 25 years.

#### Recommendations

1. Completion of the present study as planned, including further breaking down of the data by specific industries and by geographical areas. This will facilitate comparison with data on land use, population, business and industry and labor.

2. Investigation of per capita wages and salaries and the determination of trends in real income and their relation to trends in employment and to unemployment in Iowa.

3. An investigation should be made of various currently available statistical series in order to determine the practicability of constructing a monthly index of Iowa income. If practical, such an index should be constructed and arrangements made for monthly publication.

#### Labor and Labor Groups in Iowa

While the welfare of labor and industry are closely related, a study of labor and labor groups themselves is essential to the development of an intelligent policy and program for labor.

Labor problems are being analyzed from two important angles:

1. The necessary adjustments in labor necessitated by the characteristics of Iowa business and industrial development, including analysis of opportunity for employment in various industries, seasonal variations and cycles in employment, and the dovetailing or coordinating of industries to promote greater stability of employment. Analysis of the frequency and in-

VALUE OF FARM DWELLINGS - 1930

Fig. 1048-20

In general, the similarity in distribution between the values of the farm dwellings and the convenience scores is very noticeable. Southern counties rank lowest, with northern and northwestern counties next. West central, central and eastern counties rank highest. The low counties are mining counties with poor and badly eroded soils.

# IOWA STATE PLAN VALUE OF FARM DWELLINGS-1930

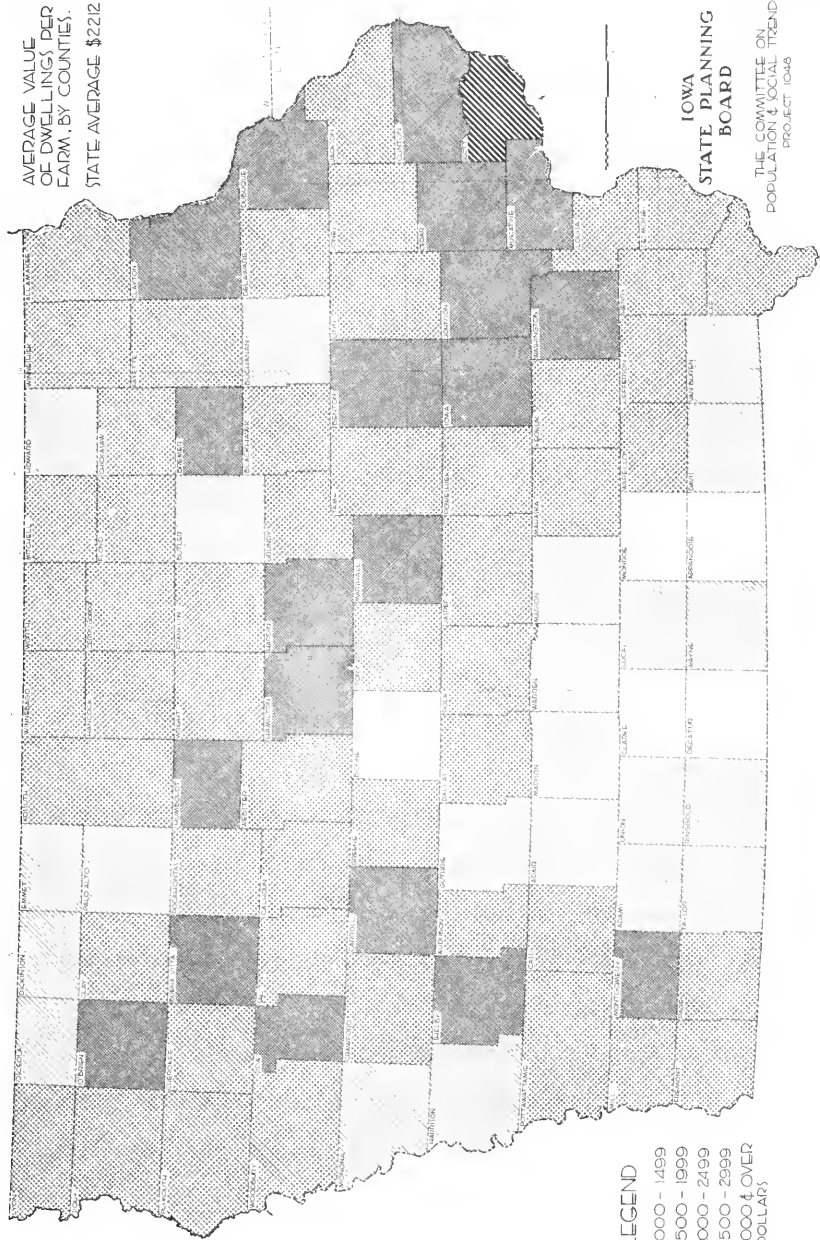
AVERAGE VALUE  
OF DWELLINGS PER  
FARM, BY COUNTIES.  
STATE AVERAGE \$2212.99

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1048 ~ 20

- LEGEND
- 1000 - 1499
  - 1500 - 1999
  - 2000 - 2499
  - 2500 - 2999
  - 3000 & OVER





cidence of industrial accidents is also included.

2. Studies of unemployment, including both employed and unemployed persons, are being made to discover, is possible, the personal and group factors which affect employment or unemployment.

#### Recommendation

The work of the committee has been under way for so short a time that results are not yet available. The work should be continued as planned for the contribution which it will undoubtedly make to the welfare of labor and the understanding of labor problems. The committee might well study also (1) the number, kinds and effectiveness of labor organizations in Iowa and (2) the possible construction of a suitable monthly index of employment.

#### Crime in Iowa

True conservation of human resources must include the reclamation and restoration to society of a large number of those now classed as criminals. It must also prevent, insofar as possible, the formation of a criminal class. Studies show that most criminals come from homes poor in material goods or located in undesirable areas. They show that attitudes within the family itself largely determine whether any particular child becomes delinquent; and, further, that in many cases circumstances peculiar to the individual make him a criminal or a good citizen in spite of the prevailing standards of either his family or his neighborhood.

In general there are two types of criminals; (1) those reared in criminal groups and (2) those who departed from the ways of family and neighbors. In Iowa the bulk of criminals are of the second type. The chief problem in preventing crime is to find these children, usually in-

VALUE OF DWELLINGS, 1930

Fig. 1048-21

Still greater variation in value of dwellings per farm is noticed when the values are computed by townships. The range is from \$785.00 in Burrell Township, Decatur County, to \$4479.00 in Grand Meadow Township, Clayton County. Both of these townships are strictly rural and are in rural counties. The variation is over 500 per cent. The distribution for the state remains about the same when displayed by townships.

# IOWA STATE PLAN VALUE OF FARM DWELLINGS-1930

AVERAGE VALUE OF  
DWELLINGS PER FARM  
BY TOWNSHIP.

STATE AVERAGE  
\$2,212.00

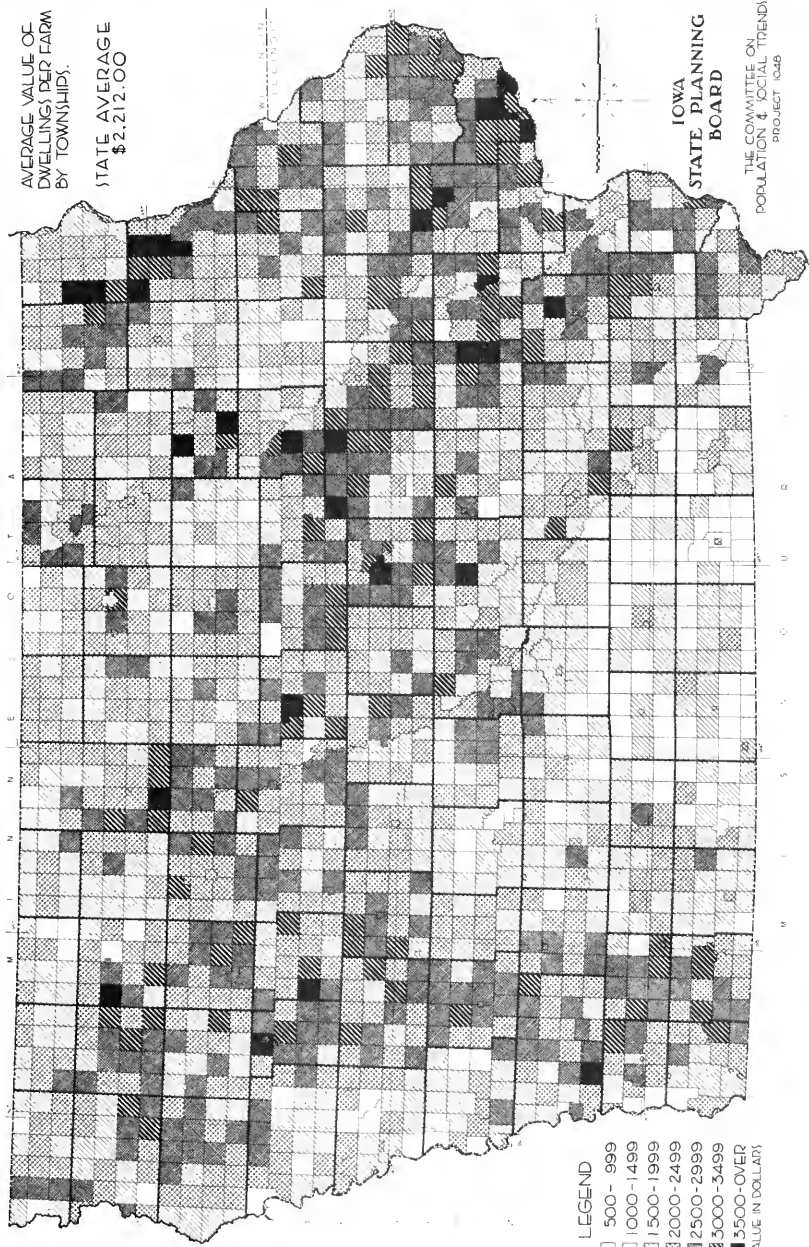
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1048-21

## LEGEND

- 500- 999
  - 1000-1499
  - 1500-1999
  - 2000-2499
  - 2500-2999
  - 3000-3499
  - 3500-OVER
- VALUE IN DOLLARS







sufficiently cared for or undisciplined, and apply approved effective methods of treatment.

Treatment of criminals has been generally none too satisfactory, largely because of the presence of conditions which tend to make a criminal fraternity and because penal discipline is not good training for free life. Many methods of handling criminals, some of them experimental, are being tried. Iowa should be quick to study these and adopt the best. Only the newer methods for meeting newer problems will be emphasized in this preliminary report. Three general problems are outstanding: (1) classification as a basis for effective treatment, (2) probation and parole, (3) costs in the various institutions from 1925 to 1932.

#### Classification

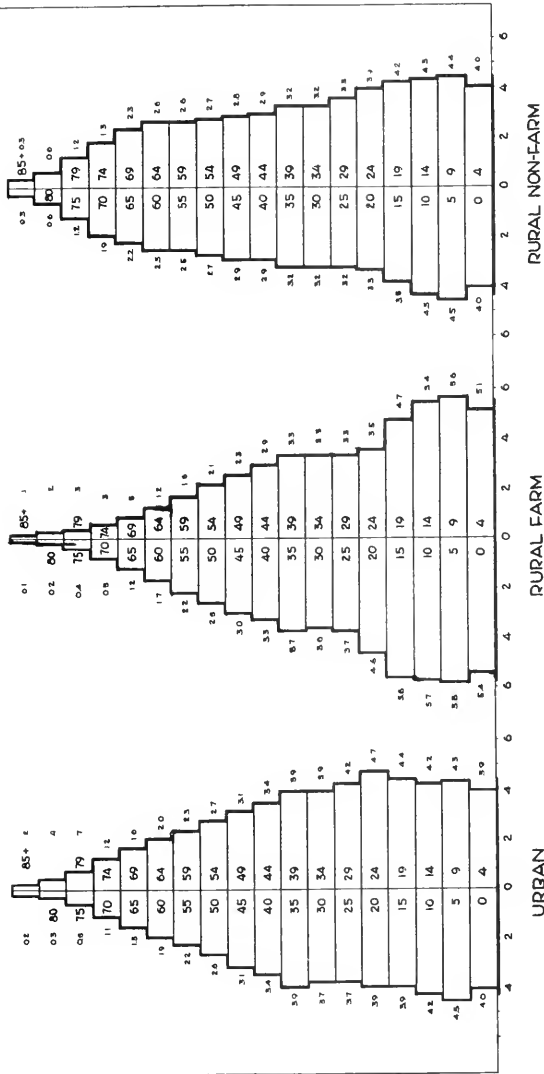
Increased effectiveness of treatment is the aim and purpose of classification. Under proper classification a group of experts would study each individual confined or to be confined and place each one where he belongs; e.g., with regard to the work he should do, where he should be located, his necessary education and his best associates. Classification is practiced at present in modified form but its effectiveness is handicapped in three ways: 1. By lack of expert staff. 2. By lack of necessary authority. 3. By lack of suitable buildings. In spite of these deficiencies, classification is gaining momentum in the United States and, more rapidly, in England.

The present types of penal buildings may make it easy for the guards but they make adequate treatment of the prisoners most difficult. Classification calls for greater variety in type of buildings and, for the most

# COMPOSITION OF THE POPULATION

Fig. 1048-22

This figure shows the decreasing proportion of children under five years of age in all classes of the population. This result of lowered birth rates is especially significant for education. In the urban population the per cent in each class increases up to 25 years of age. That the work of the city is done by younger and middle-age groups is indicated by the increased proportion of persons in the 20 - 44 age classes. This characteristic as well as the larger per cent of females, especially between the ages of 15 and 30, is due to the migration of rural young people to the city.



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# IOWA STATE PLANNING BOARD COMPOSITION OF POPULATION AGE OF FARM, RURAL NON-FARM, AND URBAN CLASSES - 1930

1048-22



part, smaller buildings and cheaper types of construction. Escape becomes less of a problem with classification. Traditional types of prison construction do not prevent escape but they do prevent adequate treatment. Even with an adequate well trained staff and diversified housing, new legislation will be necessary to give the staff authority to act and a classification center will need to be established where the prisoners can be examined and assignment made to the proper institution.

#### Probation and Parole

The real purpose of parole is to get men out of prison, but the parole and indeterminate sentence laws have increased the prison population by increasing the average amount of time served. Routine probation work must be accompanied by a mental change which will change the voluntary course of action of the probationer into a course acceptable to society and satisfying to himself. Such change involves frequent contact and persistent attempt by the officer coupled with thorough understanding of the situation. Probation and parole can be successful only when done by a staff which is adequate in number and expertly trained.

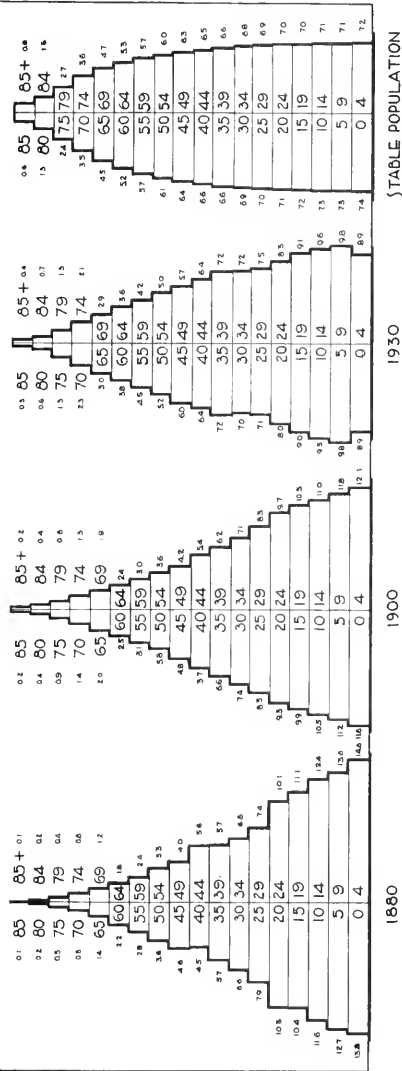
#### Measures to Prevent Crime

Suitable measures for preventing the development of criminals are indicated by case studies of patients at the State Psychopathic Hospital in Iowa City. Nineteen cases studied there in detail are listed here with the kind of treatment needed in each case.

# CHANGES IN AGE

Fig. 1048-23

As is indicated by the figure on the opposite page a constantly decreasing proportion of young people and an increasing proportion of old people are characteristics of Iowa population. Changes in migration, at first strongly toward Iowa and now away from it, increased expectation of life and decreased birth rates, all combine toward this end. The age composition of the stable population is also shown. Such a population, in the absence of migration, would neither increase nor decrease, the births just balancing the deaths.



# IOWA STATE PLANNING BOARD CHANGES IN AGE IOWA POPULATION 1880-1930 COMPARED WITH STABLE POPULATION

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1048-23





<u>Preventive Measures Needed</u>	<u>Number of Cases</u>
Jobs only, with supervision if in camp	5
Supervision while at work	3
Juvenile probation based upon psychiatric analysis	1
Strict adult probation	2
Further study and observation with supervision and placement in carefully selected homes where corrective conditions are found.	2 young women
Under observation and parole supervision in own home	1
Parole under supervision in own home	1
Insane boys, needed medical care earlier, now need psychiatric care	2
Experimental custody	1 man
Feeble minded murderess needs institutional care	1

In three of these cases, the process of parental failure is seen translated into delinquent tendencies. Prompt advice to parents, teachers and court officers at the time the child first goes wrong is one of the surest ways to prevent delinquency. These cases show the need for careful study of each case and for diversified treatment. To treat all these cases alike is wasteful and dangerous.

#### Institutional Costs in Iowa

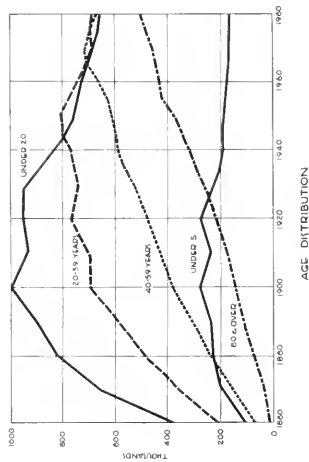
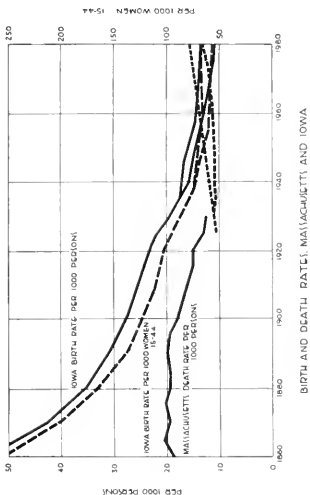
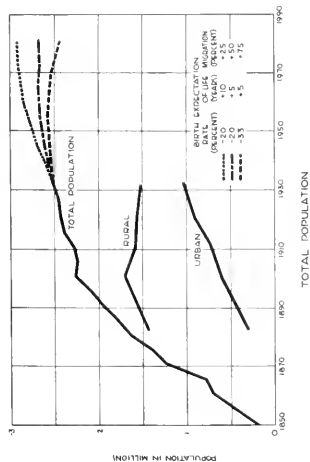
Total annual and per capita costs are reported for each institution under the state board of control. Total support disbursements for 15 institutions was \$3,900,000 in 1932. This amount has not varied greatly

# FACTORS IN CHANGING POPULATION

Fig. 1048-24

As study of this figure would seem to indicate, in the absence of new agricultural or industrial developments Iowa population may be expected to increase more and more slowly. Specific birth rates have decreased rapidly and may continue downward, becoming from one-fifth to one-third lower than at present. Death rates have decreased, especially among children. Death rates have decreased, especially among children. In the future, death rates will increase somewhat because of the changes in age distribution, in spite of increased expectation of life.

The middle-age groups will remain about the same, while the older age groups will constitute a steadily increasing proportion of the population.





from 1925 to 1932. During the eight year period the total number of inmates and patients at these state institutions has increased appreciably. The per capita costs have decreased as a result. However, when the per capita costs for each year are corrected for variations in purchasing power in the United States, the costs are shown to be relatively higher in 1932. This is not surprising when it is remembered that a large share of the costs are made up by fixed charges and salaries which do not respond promptly to changing price levels.

The information compiled shows wide variation between institutions of various kinds in the same year as well as from year to year. It also sheds light on where some of the tax money goes and emphasizes again the need for reducing the number of inmates in state institutions by the best possible preventive measures.

#### The Ideal System Made Practical

Six steps are indicated which, if, put into effect, would greatly improve the Iowa situation. These stress mental hygiene, classification, diversified treatment, probation and parole, jobs and foster care. Immediate steps are suggested which go far toward making the system immediately practical for Iowa.

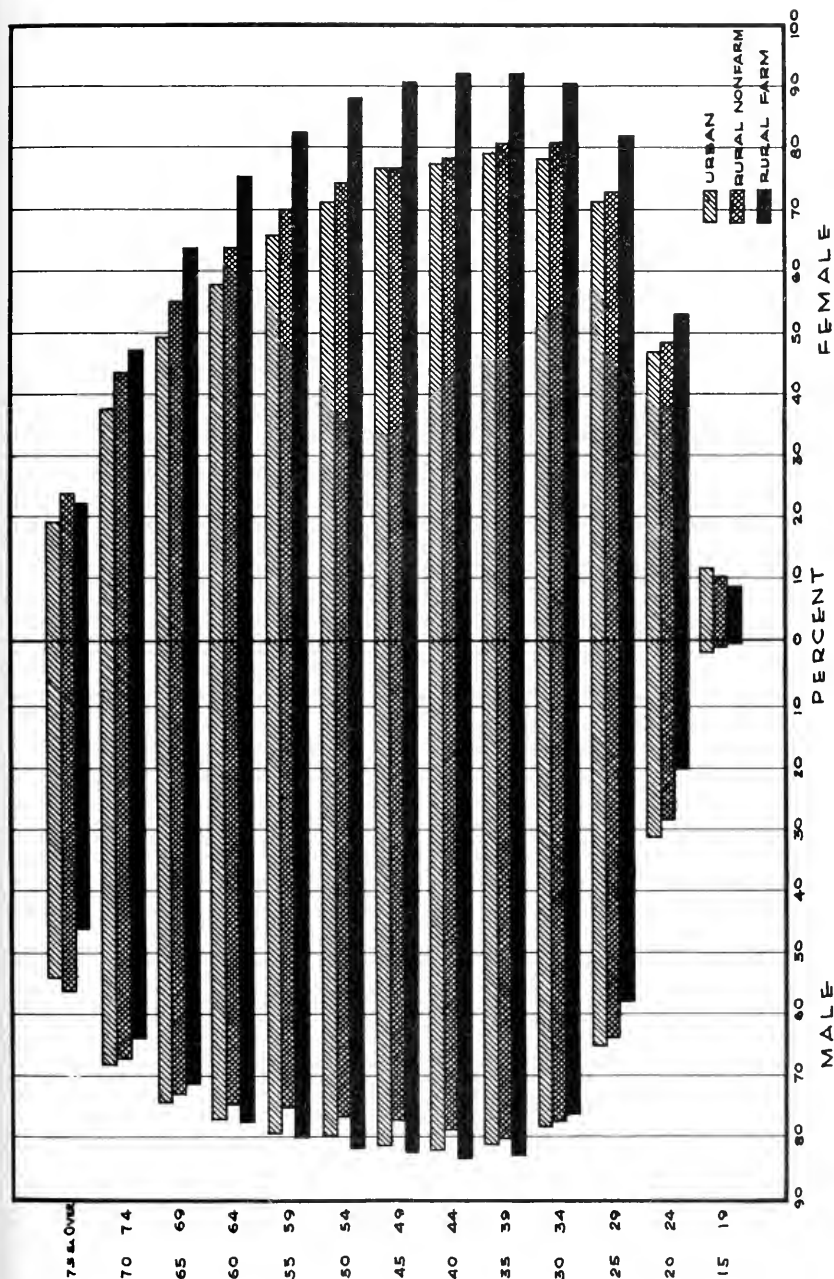
#### Recommendations

1. New legislation is needed to legalize the commitment of children to the state without designating the institution to receive them. A state classification authority should be set up to classify each case and see that it is properly placed and receives the treatment agreed upon after

MARRIAGE IN IOWA

Fig. 1048-25

The farm, village and town, and city population classes of Iowa have been divided into five-year age groupings for the purpose of presenting graphically the interesting comparisons in the per cent of marriages.



MARRIAGE IN IOWA  
PERCENT OF FARM, RURAL NON-FARM, AND URBAN POPULATION  
FIFTEEN YEARS OF AGE OR OVER MARRIED IN 1930





examination.

2. Funds would be needed for foster home care when it is needed by children committed to the state. A children's observation and residence building should be built at Iowa City as part of the psychopathic hospital. A state classification center should be established near Des Moines. Medium and minimum security buildings should be built for the overflow from Anamosa and Fort Madison. Funds or special arrangements should be forthcoming to provide work for all paroled prisoners.

3. The feasibility of a state police system for rural states should be studied. In the meantime, the state's detective force in the Bureau of Investigation should be expanded and given ample power to make criminal investigations on its own initiative. The office of rural prosecutor might include several counties where feasible.

#### Further Studies Recommended

By an active stand in furthering research on crime in Iowa it is hoped and expected that added support and cooperation may be received from F.E.R.A. to promote the work. Plans in detail are included for research along the following three lines: (1) parole prediction and the classification of prisoners, (2) case histories of crime, and (3) ecology of crime. Plans are also included for several important smaller projects.

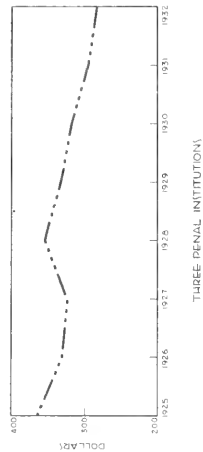
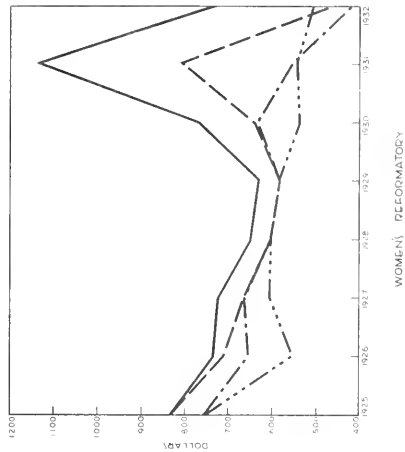
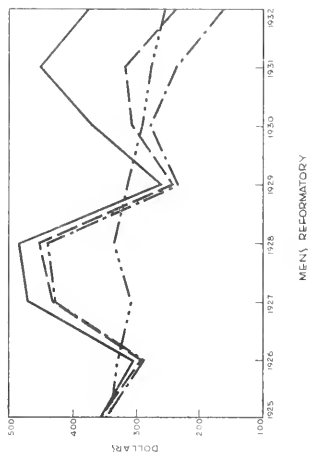
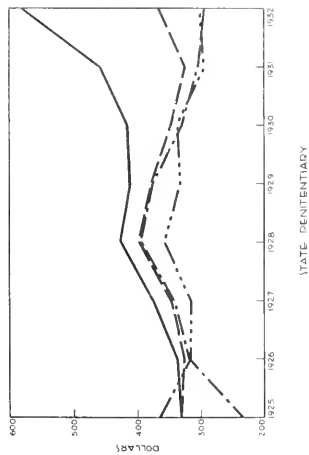
#### Social Rehabilitation

The need here is for some program which can be applied above the relief level in such a way as to foster group morale and strengthen group organization for the solution of community problems and the improvement

## COST OF RURAL INSTITUTIONS

Fig. 1048-26

Per capita costs for inmates at the state penitentiary and at the two reformatories are here shown from 1925 to 1932. Amounts for general support have decreased slightly in all three institutions. Earnings of the various enterprises within the institutions have varied widely. Returns at the penitentiary at Fort Madison, included under special funds, increased slightly until 1927 and has decreased some since then. The work returns at the Men's Reformatory at Anamosa followed a similar course but varied more widely. Returns at the Women's Reformatory at Rockwell City decreased steadily during the period. In terms of 1925 price levels the per capita support has increased quite steadily at Fort Madison but shows more fluctuation for both the men's and the women's reformatories.



# LEGEND

SUPPORT  
SUPPORT & CAPITAL  
SUPPORT & MAINTENANCE  
SUPPORT & MAINTENANCE & CAPITAL  
SUPPORT & MAINTENANCE & CAPITAL & MAINTENANCE

## IOWA STATE PLANNING BOARD COST OF PENAL INSTITUTIONS THE PER CAPITA COST OF PRISONERS IN IOWA 1925-1932

PREPARED BY  
THE COMMITTEE ON  
POPULATION & SOCIAL TRENDS  
DECEMBER  
1934

1048-26



of community situations, out of which many times, relief or other pathological situations develop. The purpose of this study is to discover, not how people make their living, but how they live. Two phases of living are emphasized: (1) recreation and leisure time activities and (2) social organizations and how they serve the people.

Davis County, a rural county in the center of the state planning picture for southern Iowa was selected for study. Davis is a multi-problem county, rough in topography with relatively poor eroded soils, a few improved roads, a decline in number of population, and located in the primary drowth area. Similar conditions are found in a number of other similarly situated counties and it is believed that Davis county shows the characteristic needs of the southern Iowa situation as well as any one county might do.

The general situation found in the county is one of social deterioration of social life, amounting almost to decadence, characterized by the general disorganization and disintegration of social life and social organizations. With the decline in size and importance of the smaller villages and hamlets, Davis has become a one-town county with the following services; weekly newspaper, bank, lodge, movie, high school, and junior college, mens' and ladies' clothing stores and a jewelry store.

Church life and organization have been deteriorating in the open country and in the hamlets while the churches in the county seat town have not absorbed the country losses. Fraternal organizations have been declining in the county seat town and disappearing in the rest of the county.

Little or no equipment of playground or recreational nature is in evidence in rural schools. One hundred clubs, varying in size and activities, serve the needs of the people who live at the county seat. Nine-tenths of these groups are for women while the men and the young people are served by the remaining one-tenth. Outstanding is the 4-H Club with 224 members among farm boys and girls in the county. These groups are organized most actively in the best farming townships. The chief characteristic is the lack of community spirit or unity in social life. In the words of a citizen, "The town is clubbed to death with purposeless time-killing clubs".

Davis County has a past and present of which it can be proud. Much dramatic, musical and educational talent is available in the county. The great need for the county seat town and for the county at large is for larger unifying interests. The need is not for better morality but for greater morale. This can best be developed by means of a program of worthwhile activities. Socio-recreational and educational activities can well lead here but civic and economic problems must be faced and solved.

A point of view and an outline for the development of promoting the cultural arts in Iowa has been furnished the committee by Professor W. H. Stacy, Extension Rural Sociologist at Iowa State College. Great variety is shown in the possibilities for developing recreation and leisure time programs along lines which add richness and satisfaction--in other words, balance--to living. The study further demonstrates that the thinking of the the people is already turned to the development of such programs. Further that expansion along lines of personal service offers a most promising opportunity for increased employment.

Recommendations

1. In Davis County certain physical facilities should be provided or expanded, including provision for a swimming pool, for playground equipment and increased play space, for paint and repair of school houses, extension of library service and for building four new community halls.

2. A socio-recreational program featuring drama and pageantry, choral music and public forum discussions on subjects of interest to local people should be set up at once in Davis and similar adjoining or nearby counties. A trained director should be in charge of the county-wide program with the assistance of local leaders and of interested and capable "white-collar" workers on relief, many of them college trained, who could be recommended by county relief workers. The Extension Divisions of the State University and the State College should furnish adequate training and helpful service to the workers on such a project.

3. Provision should later be made for a state director to supervise county recreational programs and to expand the services of the schools to include such an all year program.

4. A manual on recreational, cultural and leisure time activities and organization should be prepared and published for the use and guidance of interested workers and groups throughout the state.

5. Similar studies of other counties should be made to discover the situation in various areas of the state. Eventually such studies should characterize the entire state and establish standards for social rehabilitation in different types of Iowa communities.

General Recommendations

This report is for the most part a summary of the special findings of

research workers employed by the committee. Interested persons should look in the appended exhibits for more detailed information and plans concerning Iowa. Recommendations are made on the basis of both Iowa and other experience of course, keeping in mind Iowa conditions. Recommendations in other sections of this report are not included here.

Data already secured should be fully analyzed and widely applied. Especially important are the characteristics of the various significant areas in Iowa. Fullest possible descriptions of these localities should be made for other planning board committees. Local city, town or rural groups should be furnished local facts with plans for local self help analysis to stimulate their interest and help them with local planning efforts. State planning to be effective must quickly become local planning.

The family is the basic operative social institution and, as opportunity offers, needed research in this field may well be initiated by this committee. A comparison of rural and urban families is urgently needed along such lines as comparative mobility, fertility, economic status, and methods of adjustment to socio-economic changes.

Suitable action might well be taken by the Planning Board to encourage the more active participation and cooperation of interested federal and state agencies in the studies of crime, the relation of population movements to relief, the significance of population changes and social rehabilitation in Iowa.

The Chairman of the Board in consultation with the Director might appoint a research committee of three whose work it would be to review all proposed research projects, suggest improvements in method or organization and facilities.



approval by the F.E.R.A. research staff. Such a committee should be familiar with research completed and under way in Iowa.

Research workers have been handicapped by the inadequacies of the fiscal data available. Greater uniformity in reporting, more continuity and applicability and more ready availability are urgently needed. Possible advantages to be gained by establishing a central statistical bureau for the state should be studied carefully.

The various workers on the Planning Board have a good opportunity to survey the existing statistical material and to learn wherein it is inadequate—where there are gaps which need to be filled in. In this connection it might even be possible to suggest legislation requiring periodical reports from the various business firms and industries of the state. The experiences of Planning Board workers should be brought to bear on the solution of this problem.

Results and recommendations of the committee should be extended as rapidly and effectively as possible to the various agencies of the state which may be affected by or interested in them. Further, a description of the objectives and the organization of the State Planning Board, together with a copy of all reports and some suggestions for their use, should be sent to all college and city libraries in the state. Insofar as possible, suitable information should be furnished to smaller libraries and secondary schools in Iowa.

RURAL, SECONDARY AND ADULT EDUCATION SURVEY

Project 1043

PLANNING BOARD COMMITTEE

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Agnes Samuelson, Superintendent of Public Schools, Des Moines  
H. J. Teachout, Educational Worker, Shenandoah  
R. C. Williams, Director of Educational Research, Des Moines

## PRELIMINARY PROGRAM

For the purpose of the first six months work the Education Committee has limited its study largely to the organization and administration of public education in Iowa, using as a guide the following outline:

1. Scope of the Educational Program
  - a. Organization
    - Nursery school and kindergarten
    - Elementary
    - Secondary
    - Higher education
  - b. Special services
    - Vocational education
    - Health program
    - Library
    - Special classes
    - Post-school and adult education
    - Extension classes and adult education
    - Education by radio
    - Other educational services
2. Administration of the Educational Program
  - a. State
  - b. Intermediate units
  - c. Local units
  - d. Basis for district reorganization
    - Area, population, ability

3. Financing the Educational Program

- a. Definition for governmental responsibility for school support and fiscal control
- b. The equalization of opportunity and support  
Minimum program to be financed by the state  
The distribution and allocation of state support
- c. Safeguarding the local unit in financing extension in planning and construction
- d. Taxation and revenue requirements

4. Public School Plant

- a. New construction required by program of reorganization
- b. State responsibility for maintaining minimum standards in planning and construction
- c. Effective operation, maintenance and rehabilitation of present plant.

5. Teaching Personnel

- a. Supply and demand
- b. Recruiting
- c. Training
- d. Certification
- e. Improvement in service
- f. Salary schedule
- g. Tenure
- h. Social and economic status
- i. Pension and retirement

6. Pupil Accounting

- a. State child accounting system and administrative studies  
of pupil personnel

REPORT ON STUDIES NOW IN PROGRESS AND STUDIES COMPLETED

The committee has completed a study of the effects of the depression on the educational situation in Iowa. Reports from 875 schools with enrollments ranging from 33 to 380 have been used for comparing the schools of 1931-32 with the schools of 1933-34.

This study has brought out the following facts:

1. The total enrollment in all schools showed an increase of 0.2 per cent; the high schools, however, showed an increase in enrollment of 4.7 per cent, whereas the elementary school enrollment decreased 1.9 per cent.

2. With the increase in enrollment, however, there has come a decrease of 6.9 per cent in the total number of teachers. With the marked increase in high school enrollment the number of high school teachers has dropped off 9.0 per cent. In the elementary schools a decrease of 5.3 per cent in the number of teachers has been recorded.

3. The number of pupils per teacher in high schools increased 15.2 per cent; the number of pupils per teacher in elementary schools increased 3.9 per cent.

4. The tax levy for the school house fund dropped 0.2 per cent; the tax levy for the general fund dropped 25.7 per cent; the total tax levy was 21.6 per cent lower in 1933-1934 than in 1931-1932.

5. Listed below are the decreases in per cent of special teachers:

	<u>A</u>	<u>B</u>	<u>C</u>
Agricultural Teachers	3.1	6.0	12.3
Home Economics	4.4	12.5	16.3
Manual Training	5.9	8.1	16.8
Music	1.0	2.8	7.0
Boys Physical Training	12.7	5.2	2.2
Girls Physical Training	15.2	5.5	0.8*
Penmanship	11.1	3.1	2.8

\* Gain

A 188 normal training high schools

B 384 approved schools

C 357 Consolidated schools

### Reorganization of Rural Elementary Education

Now in progress is a study to determine in which communities of the counties of the state it is possible to close the one-room rural schools and transport the pupils to larger centers without increasing the cost. The project has been finished in six counties and is in progress in twenty-six others. It is hoped that the entire state can be covered eventually. In the following table the figures for the six counties are shown. The costs include buildings, general maintenance and repairs, transportation of pupils, etc.

TABLE 1043-A  
General Summary of Elementary School Costs per Annum under the Present and the Proposed Reorganized Systems in Six Counties in Iowa.

County	Present Rural Schools	Present Town Schools	Proposed Reorganized Schools
Washington, Story and Adams	\$198,658.28	\$933,647.15	\$1,194,546.90
Lyon	113,850.93	137,583.29	268,176.70
Hardin	78,835.83	160,002.27	264,381.51
Woodbury	<u>111,115.81</u>	<u>198,157.90</u>	<u>249,269.41</u>
Totals	\$502,411.35	\$1,429,390.61	\$1,976,374.52

Total cost of present system \$1,931,801.96

Increase due to reorganization \$45,193.56 or about 8 per cent

The six counties in Table 1043-A were redistricted into 86 independent areas involving 21,807 elementary school children, with transportation required for 8,912 of them. While the redistricting of all the schools shows a slight increase in cost, over 25 per cent of them could be reorganized at an actual saving.

If the proposed reorganization of rural education should be carried out in the above named counties, it would require the additional buildings indicated in Table 1043-B.

TABLE 1043-B

Additional Buildings Required to Accommodate the  
Reorganized Schools in the Six Counties

---

Additional Investments in buildings	\$678,515.69
Sale Value of Rural Buildings and grounds	<u>116,308.50</u>
Net Increase in investment in buildings	\$562,207.19

---

If the proposed reorganization were carried out in all the counties of the state, it appears that about \$8,000,000 of public works money would be required to supply the building needs. The accompanying chart, Figure 1043-1 shows the extent to which the one-room rural school is still with us.

School Finance

The committee is making a study of school finance in Iowa which will include an analysis of bonded indebtedness, sources of revenue, expenditures, costs per pupil, teachers' salaries and school levies. Some of the

# RURAL AND SECONDARY SCHOOLS OF IOWA

Fig. 1043-1

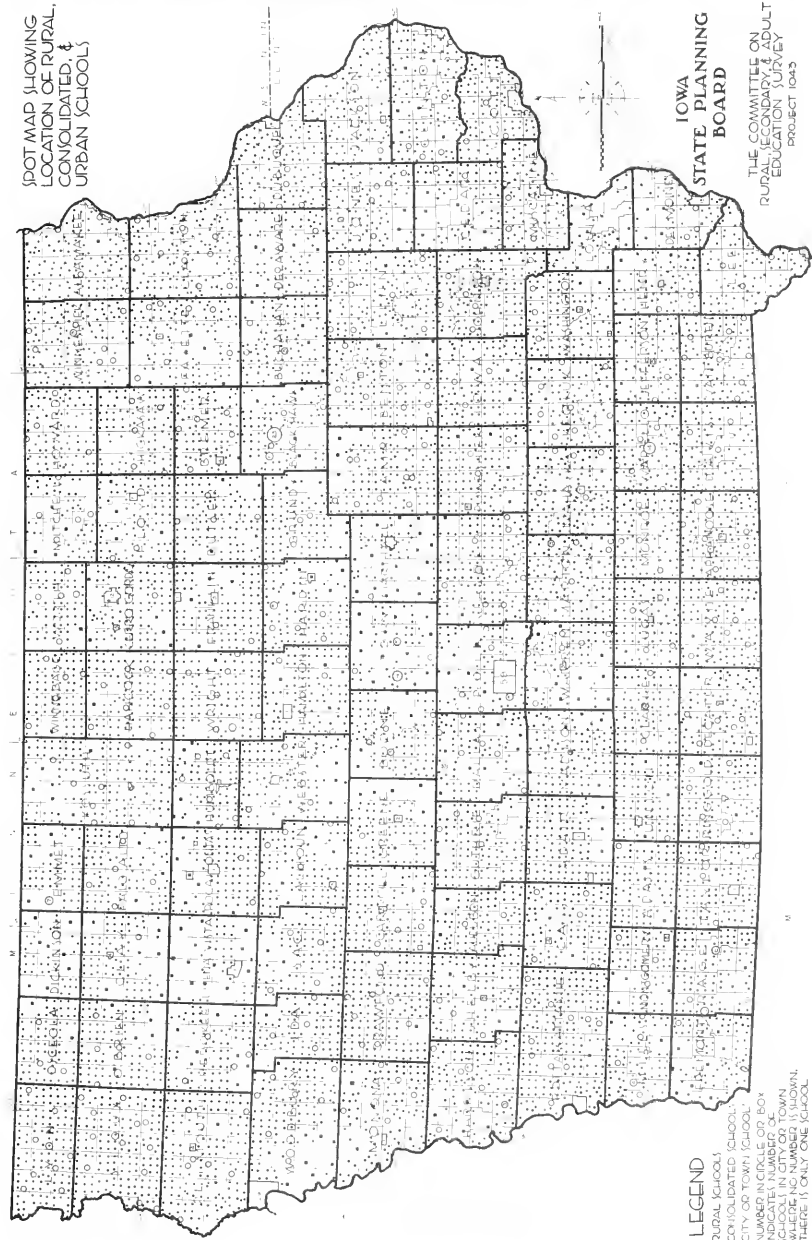
The accompanying map makes clear the fact that a very large majority of the rural people of Iowa are still dependent upon the one-room rural schools for the education of their children. There are more than 9,000 such schools in the state, serving somewhat more than 70 per cent of the total rural area. Virtually all of the remainder is served by consolidated schools, of which there are approximately 380 in Iowa.



# IOWA STATE PLAN

# RURAL & SECONDARY SCHOOLS

DOT MAP SHOWING  
LOCATION OF RURAL,  
CONSOLIDATED, &  
URBAN SCHOOLS



## LEGEND

- RURAL SCHOOLS
- CONSOLIDATED SCHOOLS
- CITY OR TOWN SCHOOLS
- NUMBERS IN SQUARES INDICATE NUMBER OF SCHOOLS IN CITY OR TOWN
- NUMBERS IN CIRCLES INDICATE NUMBER OF SCHOOLS IN RURAL AREA
- IF ONLY ONE SCHOOL, THERE IS ONLY ONE SCHOOL

IOWA  
STATE PLANNING  
BOARD

THE COMMITTEE ON  
RURAL SECONDARY & ADULT  
EDUCATION SURVEY  
PROJECT 1945

1043-1



findings and recommendations will be filed in a supplementary report which is too long to be included in the present preliminary report.

### Rural Youth Survey

There are a great many young people of the rural districts of Iowa who are not attending any organized educational institution. Of approximately 75,000 boys from 14 to 21, in the state, some 40,000 are not receiving any systematic instruction in any educational institution. The number of girls in this age group is about the same, although a larger percentage of them are attending school.

The Education Committee is sponsoring a survey, which is now under way, among these young people for the purpose of finding out their educational, economic, vocational and social status.

A field worker is visiting young people between the ages of 16 and 25 in their homes and gathering many personal data on each of them.

This study should indicate some of the needs and the nature of adult education in Iowa. It should also throw some light upon the need for public recreational centers, little theatres, libraries and other cultural facilities.

The present library facilities of the state are shown on two maps which are included in this report. Figure 1043-2 shows the distribution of Public and Association libraries throughout the state; Figure 1043-3 indicates the extent of the library service.

### Teaching Personnel

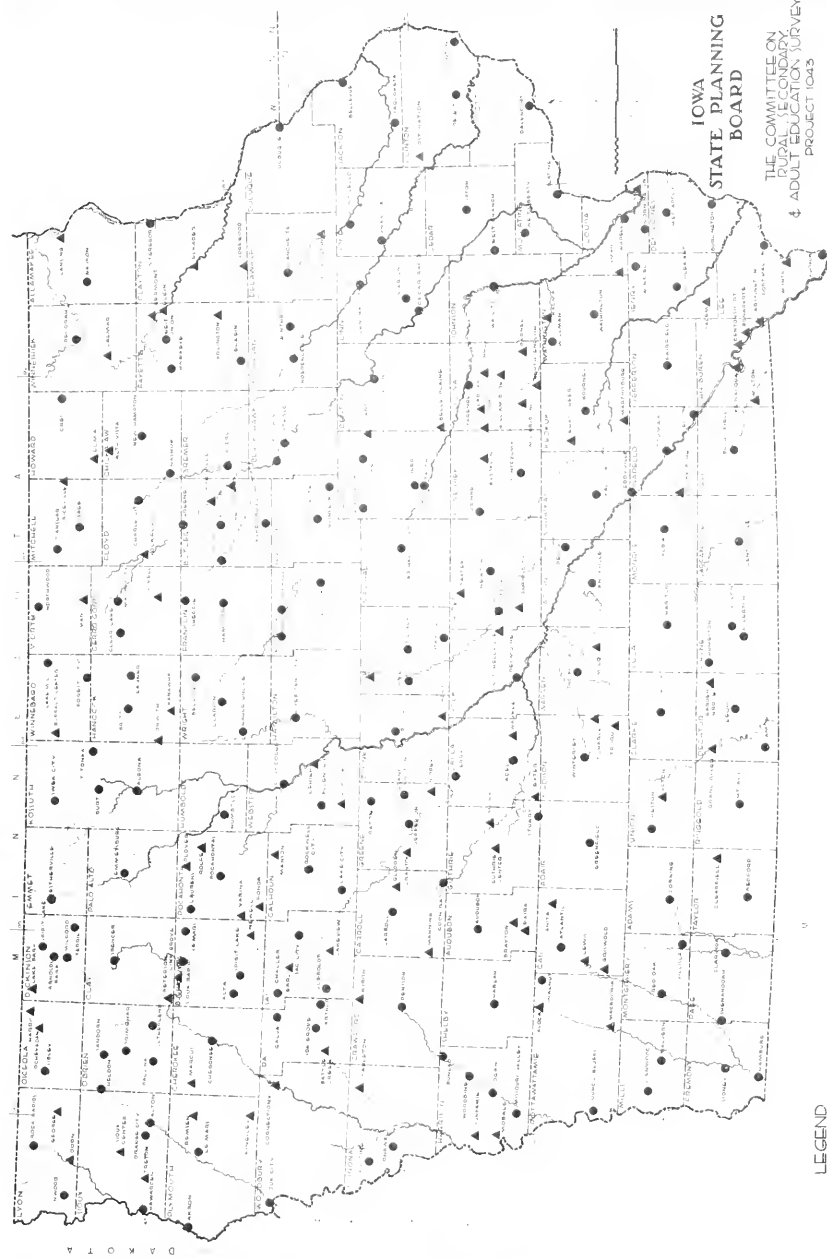
In 1929 a study of teacher supply and demand was made in Iowa, which

PUBLIC AND ASSOCIATION LIBRARIES

Fig. 1043-2

The black circles in this map indicate public tax supported libraries. The triangles indicate association and subscription libraries.

# IOWA STATE PLAN PUBLIC & ASSOCIATION LIBRARIES

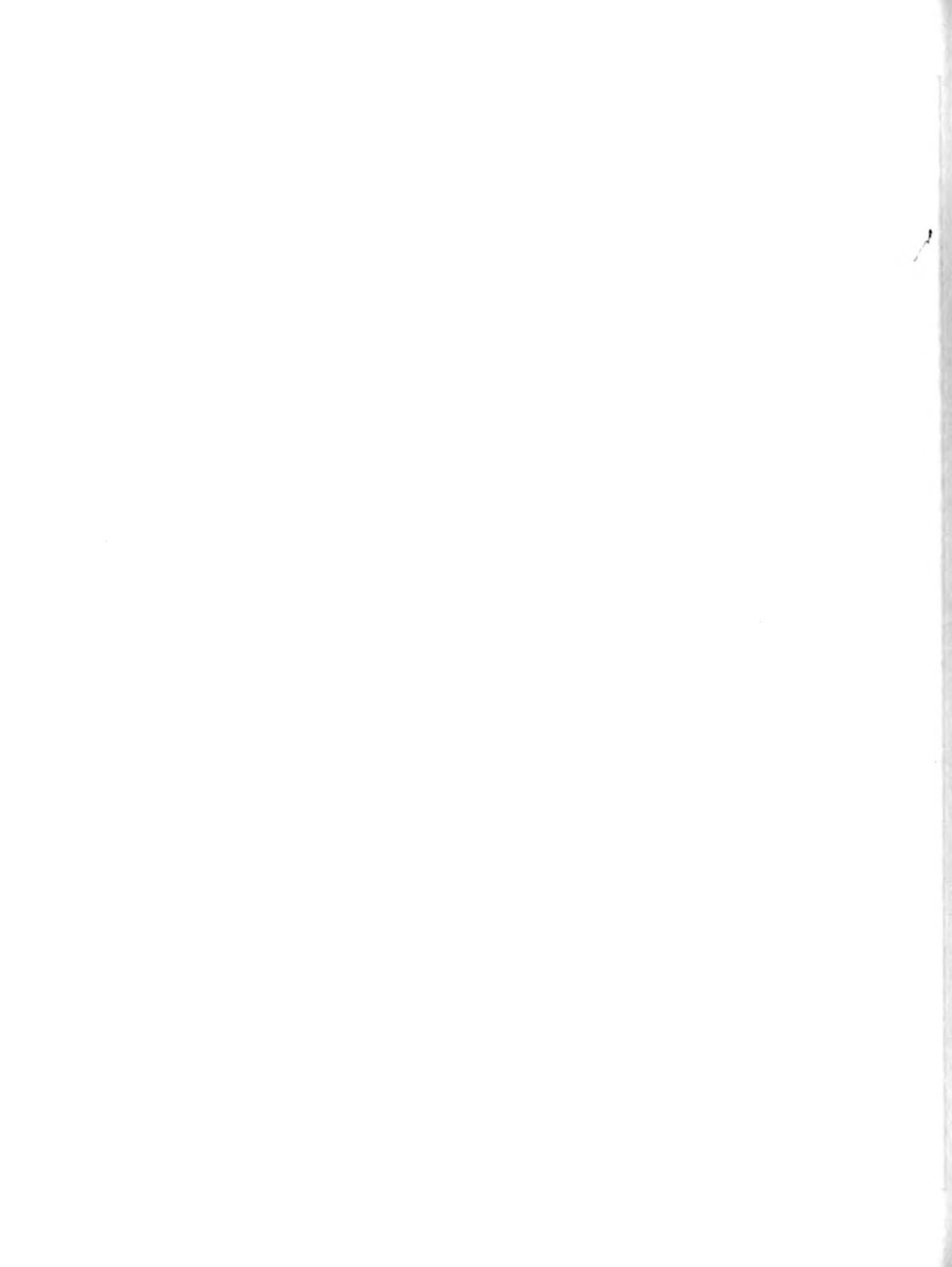


## LEGEND

- PUBLIC TAX SUPPORTED LIBRARIES
- ▲ ASSOCIATION & SUBSCRIPTION LIBRARIES

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PUBLIC EDUCATION  
& ADULT EDUCATION  
PROJECT 10423



was the most comprehensive study of its kind every made in any state. This study served as a basis for the new certification law passed by the Forty Fifth General Assembly. In 1929 it was found that the turnover of teachers in the rural and elementary schools was so great that it was impossible to raise the standards for teachers in the rural schools as high as they are in many other states. A survey is now being made to determine whether conditions have changed sufficiently since 1929 to warrant the State Board of Educational Examiners in raising the standards for new teachers entering the profession.

The study of 1929 did not include such problems of personnel as tenure, recruiting, improvement in service, social and economic status, and pensions and retirement. It will take six months or more to complete it.

#### Public School Plant

Mr. R. C. Williams, Research Director of the State Department of Public Instruction, has made a study of the school buildings of the state. The materials of his report have been incorporated into a chart which is included with the public works report at the end of this Preliminary Report. (See Figure 1053-1).

Tables 1043-C, D, and E appear to be very significant. Tables C and D indicate that there has been a piling up of building needs. If either 1914 or 1926 is taken as representing a fairly normal condition, we should spend many times more on school buildings during the next two years than we have during the last two years.

Tables D and E give some idea of the need for repairs and replacements

LIBRARY SERVICE

Fig. 1043-3

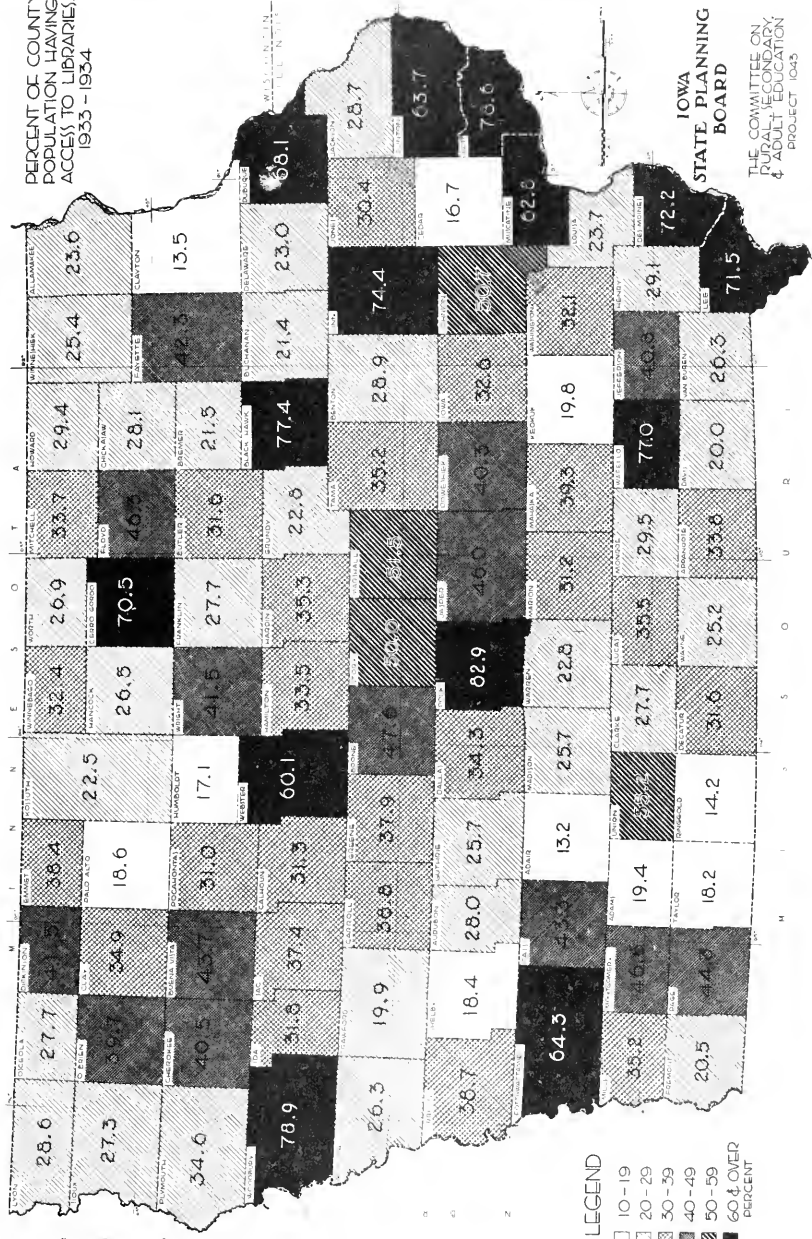
This map shows the percentage of Iowa population, by county, which has access to libraries in 1933 and 1934. In ten counties, between 10 and 16 per cent of the population had access to libraries. In twelve counties over 60 per cent had access to libraries.



# IOWA STATE PLAN

# LIBRARY SERVICE

PERCENT OF COUNTY  
POPULATION HAVING  
ACCESS TO LIBRARIES,  
1933 - 1934



## LEGEND

- 10-19
- 20-29
- 30-39
- 40-49
- 50-59
- 60 & OVER PERCENT

1045-3



of buildings. About two or three per cent of the cost of construction should ordinarily be spent annually for repairs; most school buildings constructed in the past are obsolete in 50 years.

TABLE 1043-C  
ANNUAL OUTLAY FOR NEW BUILDINGS AND SITES

Year	Total
1900	\$ 664,141.23
1905	777,241.36
1910	1,010,664.61
1911-12	1,178,261.00
1912-13	1,348,372.07
1913-14	1,563,584.12
1914-15	2,498,946.71
1915-16	2,930,712.77
1916-17	3,894,633.18
1917-18	4,801,379.91
1918-19	3,297,767.00
1919-20	3,687,012.26
1920-21	8,854,688.12
1921-22	9,093,013.92
1922-23	7,616,478.64
1923-24	6,546,428.26
1924-25	6,236,684.20
1925-26	4,846,337.53
1926-27	4,280,554.26
1927-28	2,203,083.16
1928-29	1,873,446.87
1929-30	2,952,129.33
1930-31	2,243,897.61
1931-32	1,082,897.25
1932-33	297,966.77

TABLE 1043-D

Dates of Construction of School Buildings

Date	Consolidated	Approved	Normal Training	Total	
				No.	Per Cent
1930-1934	30	26	16	72	3.47
1925-1929	35	51	28	114	5.49
1920-1924	60	69	37	166	8.00
1915-1919	85	72	55	212	10.21
1910-1914	110	72	50	232	11.18
1905-1909	135	23	17	175	8.43
1900-1904	160	53	34	247	11.90
1895-1899	113	22	23	158	7.61
1890-1894	83	19	29	131	6.21
1885-1889	96	7	10	113	5.44
1880-1884	159	12	17	188	9.05
1875-1879	169	10	8	187	9.01
1870-1874	-	1	6	7	0.34
1865-1869	66	1	3	70	3.37
1860-1864	-	1	-	1	.05
Before 1860		2	1	3	.14
Total	1301	441	334	2076	100
No Const. date		386	145		
Blanks		2	3		
No card		1	2		

TABLE 1043-E  
NUMBER AND VALUATION OF SCHOOL BUILDINGS

Year	Number of School Buildings Total	Valuation of Buildings Total
1900	13,861	\$ 17,655,992.00
1905	13,993	22,456,618.00
1910	13,896	27,233,239.00
1911-12	13,870	30,069,711.00
1912-13	13,858	30,422,709.00
1913-14	13,859	34,249,130.00
1914-15	13,681	37,061,740.00
1915-16	13,485	39,356,618.00
1916-17	13,227	47,220,562.00
1917-18	13,019	48,889,684.00
1918-19	12,947	52,084,072.00
1919-20	12,716	63,329,584.00
1920-21	12,209	70,894,883.00
1921-22	12,953	78,369,187.00
1922-23	11,898	90,966,947.00
1923-24	11,885	97,385,457.36
1924-25	12,079	105,711,346.49
1925-26	11,950	108,536,370.22
1926-27	11,999	113,741,628.78
1927-28	12,133	117,956,782.41
1928-29	11,789	124,448,295.75
1929-30	11,820	123,307,361.75
1930-31	11,757	125,942,134.88
1931-32	11,810	123,442,366.37
1932-33	11,842	119,894,802.20

HEALTH AND HOUSING

Projects 1037 - 1038 - 1039

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## HOUSING AND HEALTH

### Introduction

The name of Iowa--to many of her inhabitants as well as to non-residents--connotes fair lands, rich soil, rolling prairies and good health. With her ample space and natural wealth Iowa should be the last front in the war on the evils of present day housing. Yet in rural Iowa are found major offenses against even minimum standards of healthful housing; and urban homes for the economically lowest groups are often incredibly overcrowded, dark, and foul.

To some the situation long has been known. Civic-minded citizens called upon to aid in the drafting of housing legislation or in the conducting of investigations have become aware of unfortunate facts--and often have become embittered and discouraged. But although some have yielded to a philosophy of resignation, the battle goes on.

Recent housing surveys conducted by the Iowa State Planning Board indicate that the unfortunate facts mentioned above are of contemporary and not merely historical interest, as we shall presently show.

### Objectives of the Housing Surveys

The objectives of the housing surveys carried on by the Iowa State Planning Board are:

1. To obtain pertinent physical, social and economic data relative to housing, and health data of families in selected areas.
2. To study these data, their significance and various correlations.
3. To propose programs of action and construction according to the

HOUSING--FAYETTE, IOWA

Fig. 1037-1

Houses in the town of Fayette are on the whole in good condition. Nearly one in four houses, however, needs repainting. Rather serious is the fact that over one-third of the families in this rather prosperous town use unimproved privies, and more than one in every four has either no sewage disposal from a drain or else a drain which empties on the surface. Electricity for lighting is widely used. Many families are without running water.

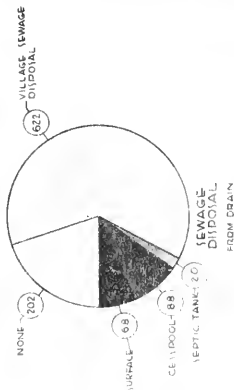
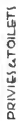
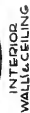
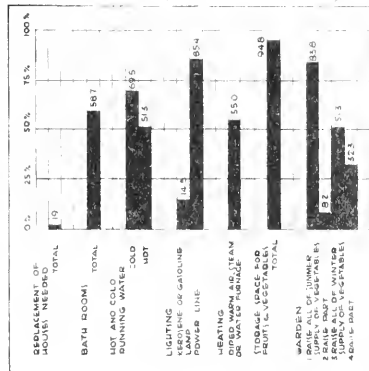
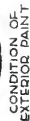




## NOTES

POPULATION 1083

FAMILIES SURVEYED 269

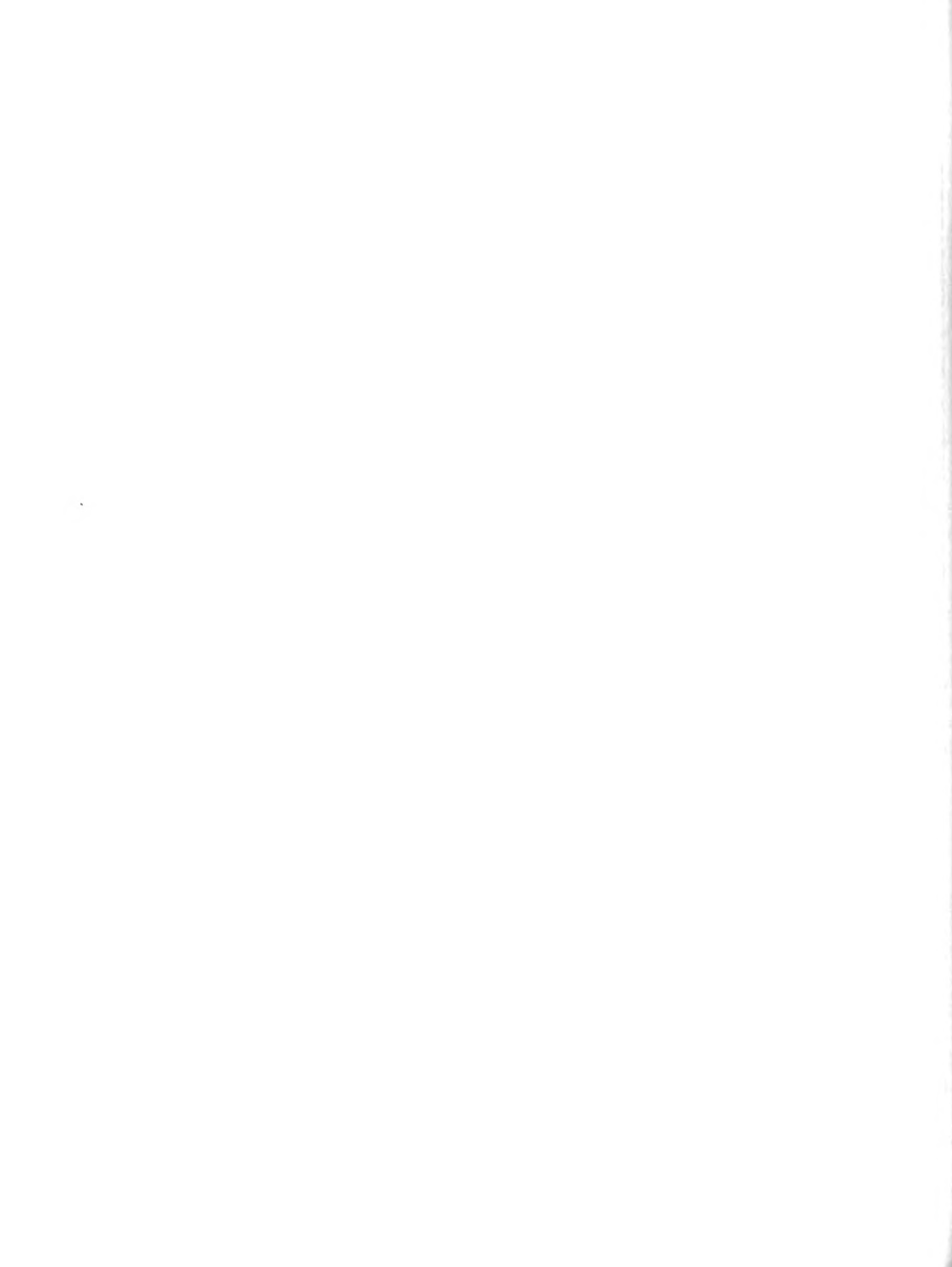


IOWA STATE PLANNING BOARD  
HOUSING CONDITIONS  
FAYETTE, IOWA  
FAYETTE COUNTY

PREPARED BY  
THE COMMITTEE ON  
TOWN & VILLAGE HOUSING

PROJECT  
1037

1037-1



findings of the surveys and the limitations of the situation.

TOWN AND VILLAGE HOUSING SURVEY  
Project 1037

In May, 1934, a town and village housing survey was begun in the following Iowa counties: Benton, Davis, Fayette, Madison, Mitchell, Scott, Shelby, Sioux, Story, and Webster. These same counties had been included in a farm housing survey conducted during the early months of 1934 with C.W.A. workers, and were selected as representative of different types of farming areas in Iowa. The town of Mystic in Appanoose County was added as representative of an Iowa coal mining community. The towns of Logansport and Centerville in Boone County were also surveyed. In all, 135 towns and villages were included.

Below are listed the number of towns according to number of inhabitants:

Under 100	41
100 to 249	38
250 to 499	29
500 to 749	13
750 to 1000	6
1000 to 1500	4
1500 and over	4

Data were obtained by enumerators, who recorded the information on questionnaires. The questions were intended to bring out present and desired housing conditions. Included also were questions for use in the Health Survey, Project 1038.

Accomplishments

The field work for this survey has been completed. Approximately 8500 schedules have been secured. A large part of the data for individual towns

# HOUSING--WAUCOMA, IOWA

Fig. 1037-2

The general condition of the houses is not as good in Waucoma as in the larger town of Fayette. A higher proportion of the houses have poor foundations, poor screens and poor interior ceilings. In this town less than two in three families have improved toilets. More than 50 per cent of the families have only surface sewage disposal. About one quarter of the families have such conveniences as bathrooms and running water.

NOTE)  
POPULATION 475  
FAMILIES SURVEYED 112

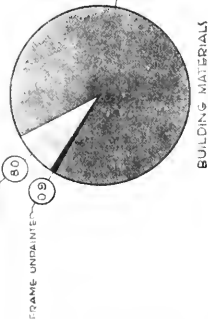
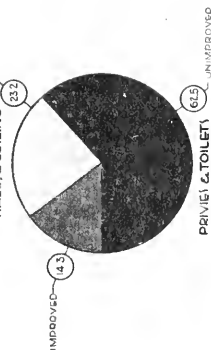
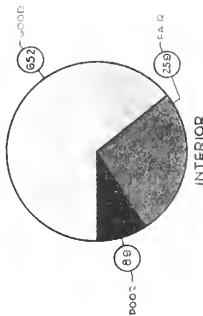
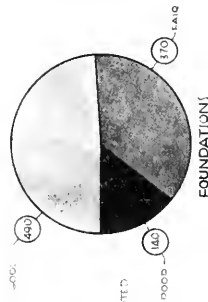
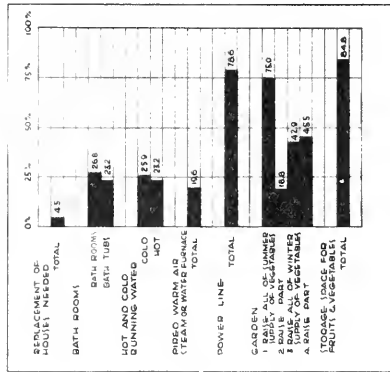
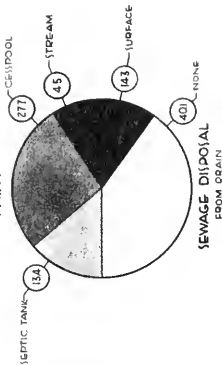
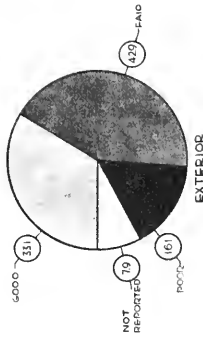
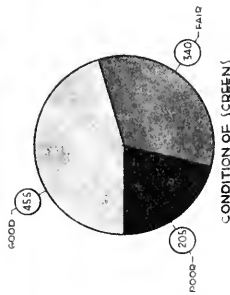
# IOWA STATE PLANNING BOARD

## HOUSING CONDITIONS

WAUCOMA, IOWA  
FAYETTE COUNTY

PREPARED BY  
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TOWN & VILLAGE HOUSING  
PROJECT  
1037

1037-2





has been tabulated. The tabulating, summarizing, analyzing, and interpreting of the data will be continued.

From a cursory study of the material gathered in this survey, the following list of major housing needs has been prepared.

1. Repairs.
2. Water systems.
3. Sewage disposal.
4. Sanitary privies where town sewerage is not had.
5. Power line to many villages and farms.
6. Fire protection through both wider use of fireproof materials and better town facilities for checking fires which occur.
7. Better storage facilities for fresh fruits and vegetables.
8. Additional houses.
9. Widespread replacement of old houses.

Diagrams on following pages are intended to illustrate salient features of Iowa town and village housing as revealed in the present survey. (See Figures 1037-1, 2, 3 and 4).

HEALTH SURVEY  
Project 1038

The Health project has been coordinated with the Town and Village Housing Survey, Project 1037, and with the City Housing Survey, Project 1039. The findings presented herein pertain to Project 1037.

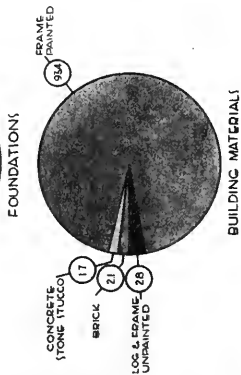
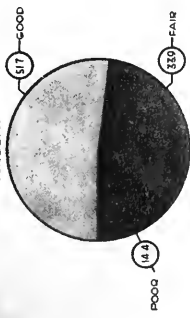
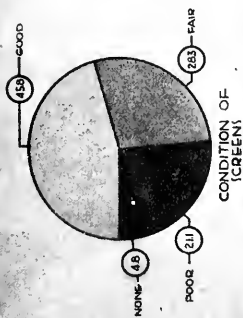
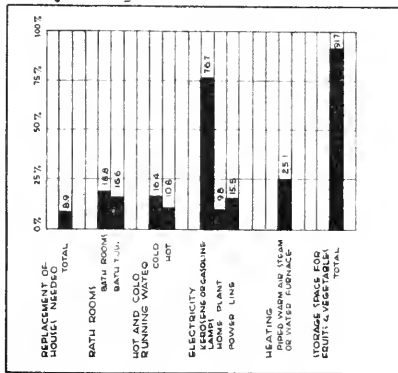
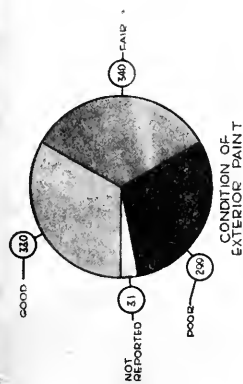
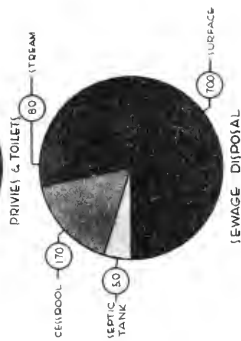
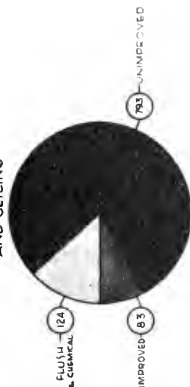
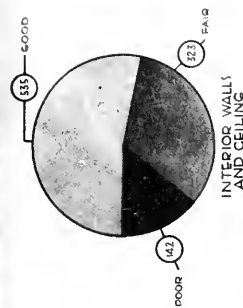
Instruction sheets and survey forms for the Health Survey were patterned after those used in President Hoover's Housing Conference Study. The health

# FARM HOUSING—FAYETTE COUNTY

Fig. 1037-3

The condition of the farm houses in Fayette County is somewhat below that of the village of Waucoma. About the same proportion in each group has poor foundations and screens. A higher proportion of farm than village families has no screens, poor paint and poor interior walls and ceilings. Need for replacement is greater for farm than for village houses. Nearly four in every five families use unimproved privies, and sewage disposal is far from ideal. The farm families are far below even the village families in percentage having bathrooms and running water and less than one in six houses in this fertile county has electricity.





NOTES  
POPULATION 14,054  
FAMILIES SURVEYED 1,948

IOWA STATE PLANNING BOARD  
FARM HOUSING  
CONDITIONS  
FAYETTE COUNTY, IOWA

PREPARED BY  
THE COMMITTEE ON  
TOWN & VILLAGE HOUSING  
PROJECT  
1037

DATA COLLECTED BY CWA WORKERS  
BUREAU OF HOME ECONOMICS U.S.D.A  
AGRICULTURAL EXPERIMENT STATION  
15C AMES, IOWA

1037-3



survey was made in 112 villages and towns having a population of 2500 or less and located in 10 of the 99 counties. Trained enumerators made a house to house canvass of 85.4 per cent of all of the dwellings occupied and located in these 112 villages. The combined population of these communities is estimated to be 45,000. A total of 6847 survey forms has been returned by the field workers to the office of the State Department of Health. No attempt has been made to determine the economic status of the families included in this study. The following data were included and recorded on the family schedule: The smallpox vaccination and diphtheria immunization status of every child of 14 years of age or less, and the incidence of measles, whooping cough, scarlet fever, diphtheria and poliomyelitis during the years of 1930 to 1934 inclusive, among children under 15 years of age, by age at which illness occurred.

#### Accomplishments

On account of the number of records involved, it is impossible to give at this time a complete and accurate report of the accomplishments of Project 1038. Final conclusions or deductions can be formed intelligently only when the survey is completed and final tabulations made.

To date only findings relating to children under 6 years of age are available.

Of the 6,849 families interviewed, 1563 were found to have 2324 children of 5 years and under. Families containing children of preschool age lived in all of the 112 villages and towns in which the study was made.

Summary data by ages for the 2324 preschool children residing in 112

# HOUSING--MYSTIC, IOWA

Fig. 1037-4

Mystic was selected as representative of an Iowa mining town. The housing conditions are extremely poor. Three out of every five houses are reported as needing replacement; very few houses are in good condition. Only 6 per cent have sewage discharge into septic tank, cesspool or stream; over 95 per cent use unimproved outdoor toilets. Electricity for lighting is the only common convenience. A smaller proportion of the families in Mystic than in the two Fayette towns raised their winter and summer supply of vegetables.

1037-4



TABLE 1038--A

Comparison between President Hoover's Housing Conference data for 37,439 pre-school children in the rural areas of 42 states, and the Iowa survey data for 2,324 preschool children in 112 villages and towns (2500 and under) situated in 10 counties. Number of children in each survey by age, number and percentage unprotected against smallpox and diphtheria.

Age	Number of Children	Not Treated Against Diphtheria			Not Vaccinated Against Smallpox					
		Iowa		Pres. Hous. Conf.	Iowa		Pres. Hous. Conf.			
		Number	Per cent	Number	Per cent	Number	Per cent			
Under										
1	345	7,372	334	96.8	7,186	97.0	343	99.4	7,329	99.0
1	301	4,151	266	88.4	3,706	89.0	296	98.3	4,055	98.0
2	429	6,496	347	80.9	5,314	82.0	409	95.3	6,182	95.0
3	426	6,940	349	81.9	5,390	78.0	412	96.7	6,414	92.0
4	398	6,621	311	78.1	4,913	74.0	370	93.0	5,865	89.0
5	425	5,859	313	73.7	4,148	71.0	384	90.4	4,813	82.0
Total	2324	37,439	1,920	82.6	30,657	82.0	2,214	95.3	34,658	93.0

TABLE 1038-B

Number and percentage of cases by age of children attacked for each of five communicable diseases predicted on a family interview study of 2324 children under six years of age residing in 112 villages and towns of 10 Iowa counties.

Age	Number of Children	Measles		Whooping Cough		Scarlet Fever		Poliomyelitis		Diphtheria		Total	
		Number	Per cent	Number	Per cent	Number	Per cent	Number	Per cent	Number	Per cent	Number	Per cent
Under 1	345	40	11.6	40	11.6	6	1.7	1	.3	-	-	87	25.2
1 and Under	646	129	19.9	121	18.7	15	2.3	1	.2	1	.2	267	41.3
2 and Under	1175	227	19.3	242	20.6	22	1.9	5	.4	1	.1	496	42.2
3 and Under	1601	336	20.9	373	23.3	33	2.1	6	.4	1	.1	749	46.8
4 and Under	1999	453	22.7	489	24.5	37	1.8	8	.4	2	.1	989	49.5
5 and Under	2324	560	24.1	630	27.1	51	2.2	11	.5	2	.1	1254	53.9



villages and towns situated in 10 counties in Iowa are shown in accompanying tables 1038-A and B.

Other tables, charts and information will be released as soon as statistical studies are completed. Considerable progress has been made on a study of the diseases of the heart, birth registration and communicable diseases in children 6 to 14 years of age.

CITY HOUSING SURVEY  
Project 1039

In June, 1934, the housing problem for relief families in Dubuque, Iowa, became very serious. A large number of families had been living in the same houses and for a number of months had been unable to pay any rent. Many of the landlords had not received enough return on their property to pay the carrying charges or maintenance costs, and had threatened to evict their tenants.

This situation was brought to the attention of the Federal Relief Administrator, who recommended that the city officials request the Iowa State Planning Board to conduct a health and housing survey in their city. The city officials immediately made this request, which was granted. During the two following months a careful analysis and study of housing in Dubuque was made.

As in the Town and Village Survey, schedules were filled out in various homes by enumerators; the latter were in this case citizens of Dubuque. The schedules or questionnaires were based upon those used in the preceding rural and town surveys, but also included additional questions. Information relative to the health of the family members was again sought, as in Project 1037.

HOUSING IN THE FLATS

Picture 1039-A

Fore and aft views of one of the least inhabitable houses in the "flats" are presented here. The occupants seem quite inclined to accept things as they are. The building is beyond the state of repair; the floor is thoroughly ventilated by means of broken boards and rat holes. The wall paper, as if refusing to shelter its hordes of vermin, hangs in large portions from the walls and ceilings.





Actual field work was begun in Dubuque on June 26, and continued until July 31. On August 1 activities were under way in Des Moines. The problem areas of the latter city, it is expected, will be sufficiently covered by September 15, 1934.

#### Accomplishments

In the survey of Dubuque, approximately 3800 schedules were obtained. Part of the data has been analyzed and presented graphically and otherwise in the complete report of the housing coordinator. (See Pictures 1039-A and B, and Figures 1039-1, 2, 3, 4, 5 and 6). A total of about 5000 schedules is anticipated from the Des Moines survey. As yet no analysis of the partial findings in that city is available.

Following is a summary of the coordinator's report of the Dubuque housing situation:

Various governmental and other agencies are making more possible a concerted housing program in our cities. Since the action employed in any particular community must take cognizance of the local situation and as a result of a rapid but, it is hoped, not too superficial study of Dubuque's problems the following facts and comments are offered.

1. The rich history of Dubuque, told in its homes, its culture and its industry, is threatened with another, less pleasant chapter as a result of economic distress and the ensuing disturbances.

2. Dubuque should not predicate its recovery upon the expectation of a rapid population growth unwarranted by past and present trends.

3. Carrying out the Dubuque Zone Plan, prepared by John Nolen, will

HOME ON SYCAMORE

Picture 1039-B

A revised railroad coach, owned by a local citizen to whom it brings a monthly rental of \$5.00, serves as a home for a deserted mother and daughter. Divided into bed room and kitchen, the interior is cluttered with furniture and junk except for a path--suggestive of the original use of the structure--from end to end. The immediate environment includes a slaughter house, the B. Branch open sewer, and a complete absence of standard sanitation.







tend to improve living conditions and stabilize values, and will encourage the development and rehabilitation of present platted land rather than of parasitic suburban property which takes from the city without contributing to it.

4. Bas housing helps to create and intensify civic problems of public health, blighted property values, and fire control; and its relation to crime and delinquency is sufficiently tangible to warrant the opinion that correcting the housing evils will tend to mitigate the others.

5. While the general social conditions in Dubuque are good, many homes suffer from a lack of proper physical environment and of adequate facilities for sanitation and recreation.

6. The large population groups separated according to social and economic standards are in general the same as those formed by the main topographical demarcation--between the hills and the flats, with the former considerably higher in standards as in elevation.

7. Tentative findings of the City Housing Survey indicate a great need for better housing facilities among certain areas inhabited chiefly by low-income families, and need for much repair work among practically all the areas surveyed.

8. The "normal" market for new housing is a matter of historical interest; a new conception of the normal market must come, bringing with it provision for low-income families--hitherto neglected.

9. Recent methods of supplying houses in Dubuque have entailed the usual construction and financing, the latter--except when simplified by cash payment--taking the form of amortized or straight mortgage, or con-

## SLUM AND BLIGHTED AREAS

Fig. 1039-1

This map shows approximately the location and size of slum areas (economic and social liabilities--indicated in black) and blighted areas (economic and potentially social liabilities--indicated by dots). The "flat" from 7th Street to 19th Street and from Elm Street east is unquestionably the poorest settlement of the city. A comparison between this map and any portraying a subject such as family income, rentals, or recommended replacements emphasizes the direct relation among the social, economic and structural aspects of housing.

## CHILD DELINQUENCY

Fig. 1039-2

This map indicates for the years 1924-1934 the homes of child delinquents. Each dot represents one case of a child found guilty of a misdemeanor or felony--petit larceny being the crime in most cases. The map does not show cases of children reported for mischievous pranks and similar minor offences. While the concentration areas seem to correspond to poor housing sections, actual delinquency is the result of many factors, including a lack of adequate playground facilities, etc. Rather than that delinquency is attributable to bad housing, it may be said that both features of our society have similar causes.

# IOWA STATE PLANNING BOARD DUBUQUE, IOWA



MAP SHOWING  
SLUM AND  
BLIGHTED AREAS

AS OF AUGUST 1964





# IOWA STATE PLANNING BOARD DUBUQUE, IOWA



CHALLENGE  
A COMMITMENT TO EXCELLENCE  
A COMMITMENT TO THE FUTURE





tract purchase.

10. The effective market for housing may be increased by improving the quality and management of the projects and by lowering the various cost items.

11. Dwelling types, governed in the future by zoning restrictions, include at present the usual gamut from single family house to large apartment, distributed in a more or less customary manner with the more intense types near the center of the city.

12. Satisfactory dwelling space is within the reach of those economically able to demand it; and outside the control of those not so prepared.

13. Housing costs pertaining to the four factors, land, planning, construction, and financing may all be reduced through the proper application of present means.

Based upon the findings in Dubuque, summarized above, are the following recommendations (excerpts from the report):

The housing problem of Dubuque is to provide an adequate supply of good dwellings properly distributed as to location, type of structure, size, and needs--and to insure against the occupancy of dwellings unfit for use. This problem requires immediate action on a planning program for both the present and the future.....

Following is a chart showing the recommended organization of the Mayor's Housing Commission, the various committees in the commission and the objective of each. Proposed activities for the several committees include:

# RELIEF LOAD

Fig. 1039-3

The correlation between relief load concentrations and slum and blighted districts is due partly to the necessity, imposed upon families with curtailed income, of moving into increasingly poorer sections where cheaper rents prevail. Not only do people in poor housing areas require more relief, but people on relief require cheaper--and correspondingly poorer--housing.

# RECENT HOUSING

Fig. 1039-4

Eloquently told in this chart is the story of many new homes for people whose annual incomes, if in proportion (a house should cost about twice the annual income of its occupants), were from \$2,000 to \$5,000 during the decade beginning in 1924--and of few for those probably more in need of rehousing because of continued existence in dwellings structurally and socially much worse. Figures upon which the chart is based were obtained from the office of the Dubuque City Building Inspector.



# IOWA STATE PLANNING BOARD DUBUQUE , IOWA



1950  
RELIEF LOAD









1. Securing the demolition of all vacant dwellings that cannot be made fit for human habitation, and the removal of certain enumerated fire hazards.

2. Encouraging and facilitating repair and remodeling work through various governmental and other agencies for easier financing, and through additional means as suggested for development.

3. Studying the problem of rehousing a part of Dubuque's population in order to secure not merely improved but positively good standards; and utilizing certain Federal aids (particularly those offered by the Housing Division of the P.W.A., and by the Subsistence Homestead Division of the Department of the Interior).

4. Informing the citizens of Dubuque as to existing housing conditions, what must be done, and what methods have been and should be devised.

5. Promoting the enacting and the enforcing of desirable housing legislation, both local and state.

#### FUTURE SURVEYS

Work for the immediate future includes a complete Health and Housing Survey in Ft. Dodge, to be started on or about September 16, 1934, and a Health Survey in Sioux City. The latter, in which local relief labor will probably be used for a part of the data gathering, will be started in October.

ZONING AND CITY AND REGIONAL PLANNING

Project 1042

PLANNING BOARD COMMITTEE

William P. Woodcock, Chairman, Board of Conservation, Spencer  
A. E. Rapp, State Fish and Game Commission, Council Bluffs  
P. F. Hopkins, Chief Engineer of P. W. A., Des Moines

-----  
PROJECT SUPERVISOR

J. R. Fitzsimmons, Landscape Architect, State Board of Conservation, Ames

-----  
TECHNICAL ADVISORS

Norman A. Morris, Landscape Architect, Extension Service, I. S. C., Ames  
L. J. Murphy, Engineering Extension Service, I. S. C., Ames  
T. W. Schultz, Professor of Agricultural Economics, I. S. C., Ames  
L. O. Stewart, Professor of Engineering, I. S. C., Ames

## ZONING AND PLANNING OBJECTIVES

The zoning and planning committee has endeavored to collect all available information on parks and playgrounds in Iowa, and to discover what could be learned regarding city planning ordinances, in effect or proposed.

The committee has done considerable research on matters of land use zoning for the purpose of formulating a possible future state program for the control of buildings and construction in order to protect private and public investments and to preserve the amenities of rural and urban communities.

## ACCOMPLISHMENTS

A data survey crew covered the entire state of Iowa for the purpose of collecting the information mentioned above, namely:

1. Information on existing recreational facilities in the state.
2. Information on all existing zoning laws in effect.
3. Information on the progress of city planning in the state to date.

The seven field workers in the survey crew, cooperating with the local federal emergency relief administration authorities in each county, collected and tabulated data on each city, town, or village as follows:

1. Population - major occupation, per capita wealth, distribution.
2. Physical characteristics - topography, geology.
3. Area - total, per cent developed privately and publicly, per cent in residential use, per cent in commercial use, per cent in industrial use, per cent in streets, per cent in railroad use, per cent in parks, boulevards, playgrounds, etc., and per cent vacant.

RECREATIONAL FACILITIES-1034

Fig. 1042-1

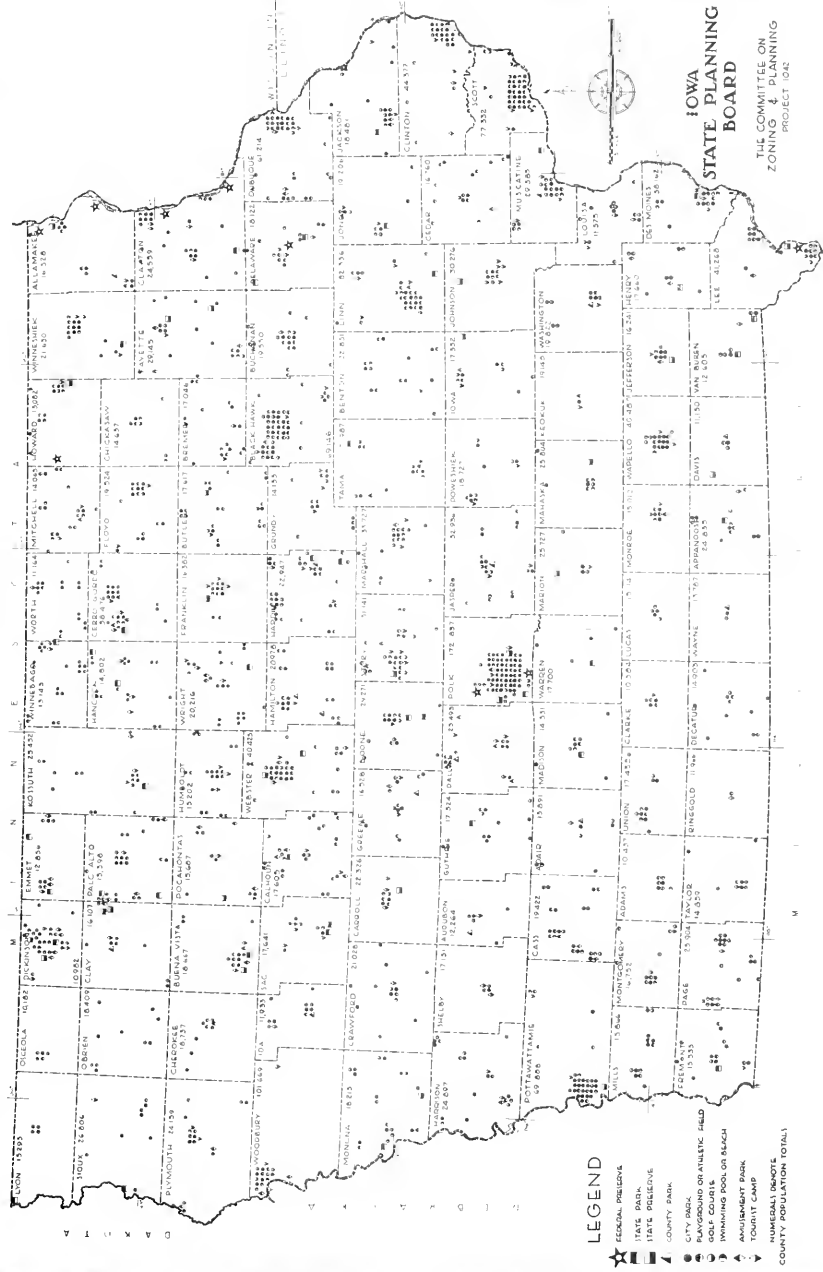
Location and type of recreational areas existing in Iowa.

A study map providing basic data of existing recreational facilities--their character and distribution. It reveals the areas in which studies will be necessary to determine the location, type, and extent of future recreational provisions.



# IOWA STATE PLAN

# RECREATIONAL FACILITIES • 1934



IOWA  
STATE PLANNING  
BOARD  
THE COMMITTEE ON  
ZONING & PLANNING  
PROJECT 1042

1042-1



4. Playgrounds - area of organized play space, area of school ground play space.

5. Other recreation - per cent in active recreation (baseball, etc.) per cent in home recreation (games, music, reading) per cent to theatres, per cent dancing, per cent driving or riding.

6. Local transportation - per cent by taxi, per cent by bus, per cent by street car, per cent by private vehicles.

7. Goods shipped - per cent by truck, per cent by R. R., per cent by other means.

8. Goods received - per cent by truck, per cent by R. R., per cent by other means.

9. Zoned - yes or no, and if so the means.

10. Subdivision control.

11. Utilities - per cent of area served by: electricity, telephone, water, sewer.

12. Outstanding opportunities for public works. Extent, need, probable cost.

Specific data from each county included a re-check of the 1929 recreational survey and the addition of new data to bring it up to date. Locations on all-weather roads were recorded, as well as the locations of rural churches, schools, cemeteries, commercial stands, filling stations, etc.

Much of this information has been valuable in connection with the work of other committees of the State Planning Board including the committees on education, public works, town and village housing, water flow and supply, stream

AREA IN STREETS

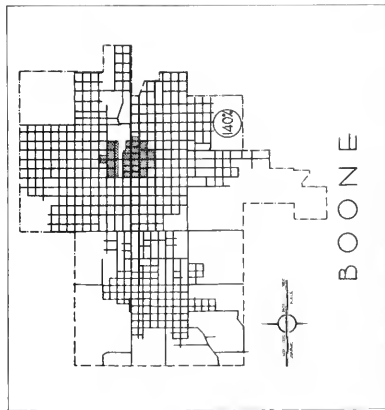
Fig. 1042-2

Comparative studies in streets--extent, pattern, and trend of development in various Iowa towns.

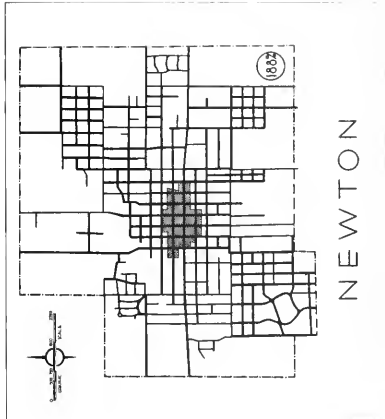
The varying methods of street design, block lengths, street widths, and their effect on per cent of area used for streets can be compared, thus acting as a guide for future street layout.

# IOWA STATE PLAN

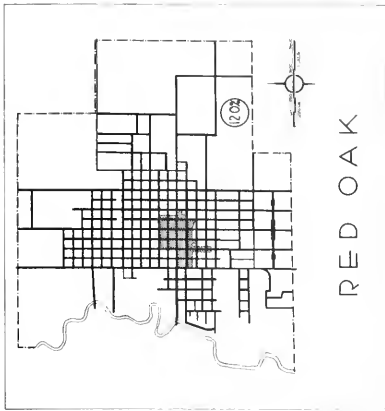
# AREA IN STREETS



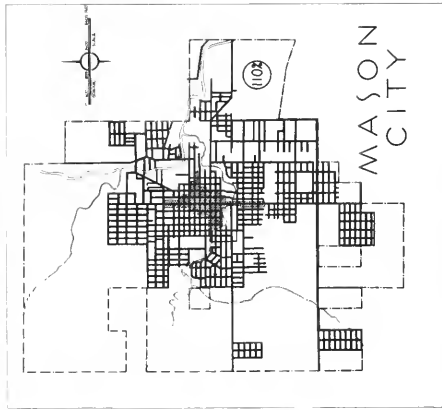
BOONE



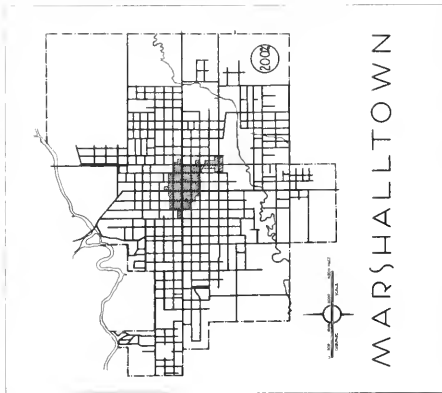
NEWTON



RED OAK



MASON  
CITY



MARSHALLTOWN



AMES

IOWA STATE PLANNING BOARD  
THE COMMITTEE ON ZONING & PLANNING

LEGEND  
CORPORATION LIMITS  
COMMERCIAL AREA  
AREA IN STREETS



pollution, public service, etc.

### Data on Recreation

To appraise fully the extent of recreation in Iowa we would first have to determine what constitutes recreation. What is recreation for one may be work for another. We can, however, get a fairly good picture of the extent of recreational activities in the state by considering the extent of the places in which recreation in an active form is carried on. About 75 per cent of adult recreation is concentrated about the home.

Amusement parks, dance pavilions, band concerts, athletic fields, swimming pools, libraries, etc. provide centers of recreational activity for youths and adults, while the home playground, parks and community centers are the areas for the play of children.

A census of these physical areas of recreational activity does not measure the extent of their recreational value. It can only indicate the extent of available facilities, the assumption being that the demand which has given rise to their existence is of such a nature as to assure their use.

This survey has found the following outdoor recreative facilities in Iowa. (Refer also to Figure 1042-1):

<u>Number</u>	<u>Recreational Facility</u>	<u>Total Acreage</u>
66	Amusement parks	1050
529	City parks	7180
21	County parks	661
40	State parks	8962
137	Public squares	338
7	National preserves	

RESIDENTIAL AREAS

Fig. 1042-3

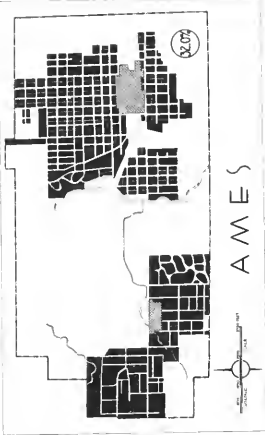
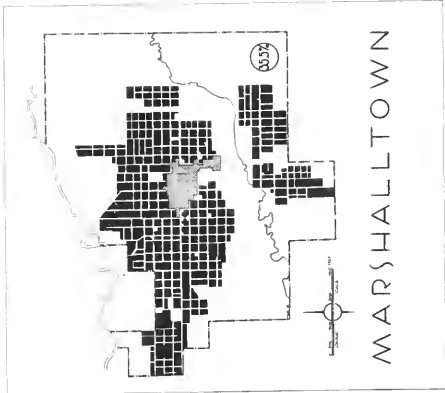
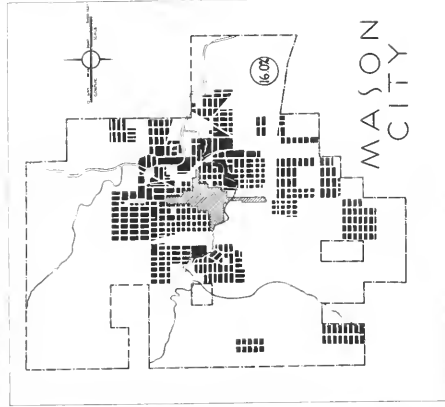
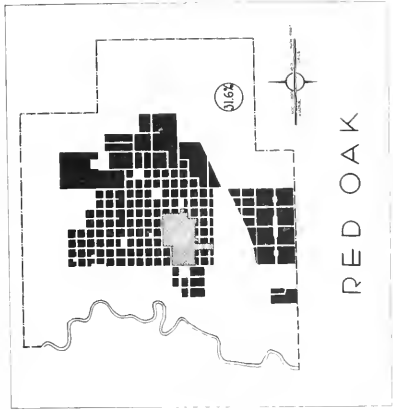
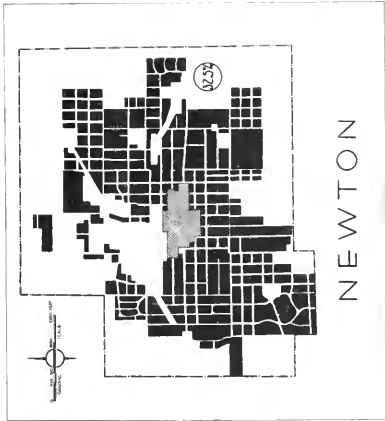
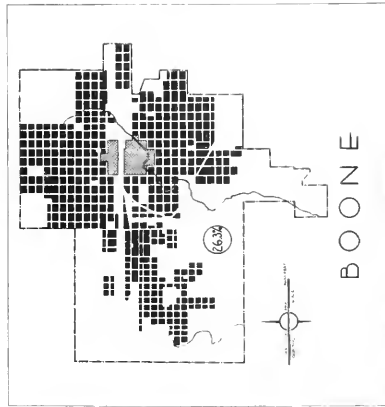
The area in use for residential purposes and their distribution in selected Iowa towns.

Showing the percentage of total city area used for residential purposes, the direction of growth of such areas about the areas of productive activity or income producing areas.



# IOWA STATE PLAN

# RESIDENTIAL AREAS



IOWA STATE PLANNING BOARD

THE COMMITTEE ON ZONING & PLANNING

LEGEND  
 CORPORATION LIMITS  
 COMMERCIAL AREAS  
 RESIDENTIAL AREAS



<u>Number</u>	<u>Recreational Facility</u>	<u>Total Acreage</u>
33	State preserves	
50	Private preserves	2967
171	Tourist camps	555
117	Community centers	
181	Playgrounds	594
331	Athletic fields	1520
206	Golf courses	10,444
168	Swimming pools	
104	Boating routes	
114	Public institutional grounds of a park-like nature	
101	Private picnic areas used by the public	
62	Aviation fields	7110
150	Dance pavilions	
245	Band concert pavilions	

These tabulated data from our field survey reflect in part the public manifestation of recreative activity within the state. Many projects of the rural community recreation organizations, the home projects of the Farm Bureau, the Farmer's Union and the Grange, and the widespread activity of the Boy Scouts, Girl Scouts, Campfire Girls, Lone Scouts and 4-H Clubs constitute an additional field of recreative endeavor which is very difficult for us to estimate correctly but which is essential in a resume of recreational activity in Iowa.

COMMERCIAL AREAS

Fig. 1042-4

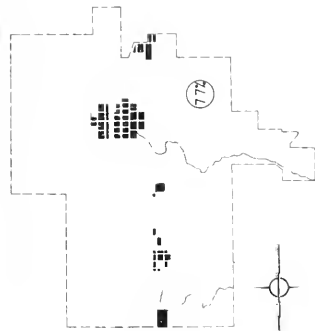
Comparative studies of commercial area in various selected Iowa towns.

The extent, direction of growth and distribution of commercial area in these towns shows the natural tendency of business to reach out to meet the people in the residential areas. Major commercial activity is centralized with limited supplementary areas to serve local use.

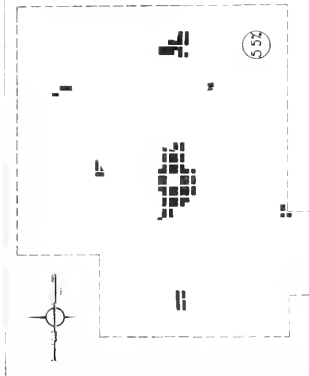
# IOWA STATE PLAN

# COMMERCIAL

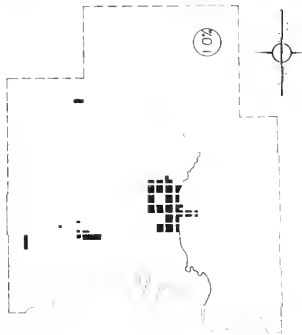
# AREAS



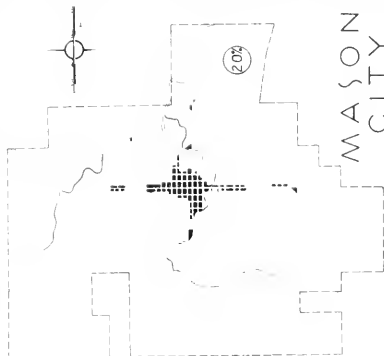
BOONE



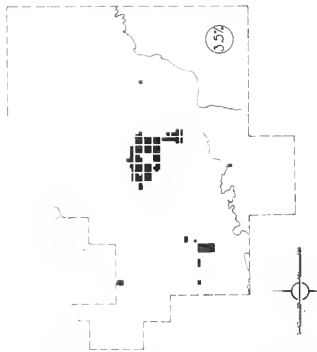
NEWTON



RED OAK



MASON  
CITY



MARSHALLTOWN



AMES

## IOWA STATE PLANNING BOARD

THE COMMITTEE ON ZONING & PLANNING

LEGEND  
CORPORATION LIMITS ---  
COMMERCIAL AREAS ■



Data on Zoning and Planning

In approaching the questions of zoning and city planning it was the opinion of the committee that zoning and planning should be grouped together under the one heading of City Planning since zoning is an essential step in carrying out any city plan. From the 257 cities which were surveyed it was found that comparatively few had taken very active steps in what might be called real city planning. City plan commissions are in existence in: Ames, Cedar Rapids, Council Bluffs, Des Moines, Dubuque, Iowa City, Mason City, and Sioux City.

An excellent plan was prepared in Keokuk for the Keokuk Industrial Association in 1917 by John Nollen; however, this plan--like many others that have been made in this country--has not been carried into effect through the efforts of a city plan commission.

There are eight cities which have prepared city plans and which have a city planning commission in charge. Thirty-three cities in the state have zoning plans.

These data reveal that, out of 16 cities of the first class in Iowa, up to the present date 15 have been zoned. A tabulation of these cities of the first class with their populations is as follows:

Burlington	26,744	Iowa City	15,340
Cedar Rapids	56,097	Keokuk	15,106
Clinton	25,726	Marshalltown	17,373
Council Bluffs	42,048	Mason City	23,304
Davenport	60,751	Muscatine	16,778

INDUSTRIAL AND RAILROAD AREAS

Fig. 1042-5

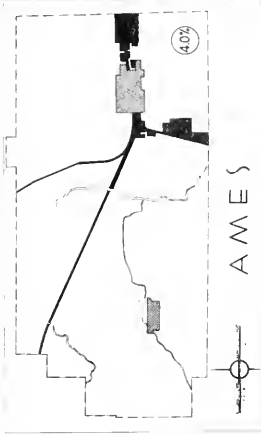
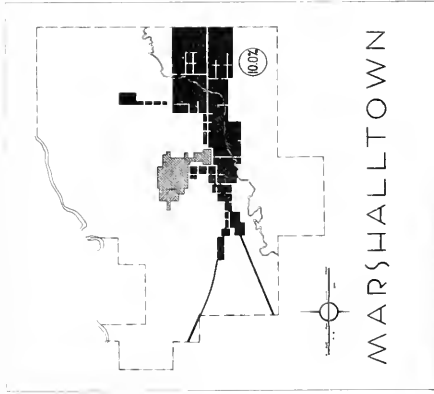
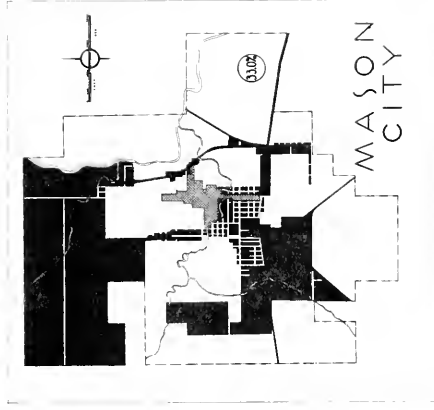
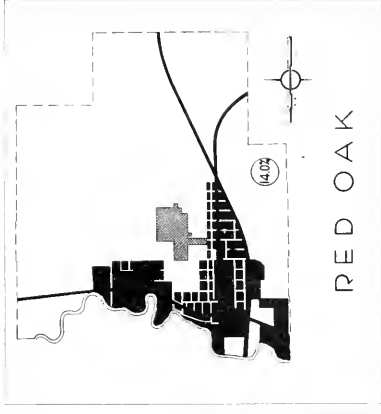
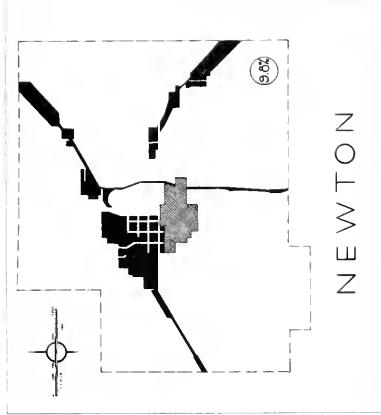
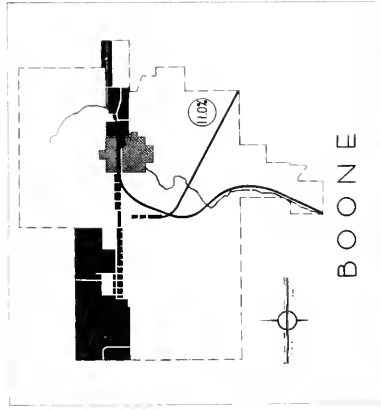
Comparative studies in the percentage and distribution of Industrial and Railroad Areas.

The percentage of the total city occupied for these uses varies in amount and depends upon the dependency of the town on those elements for its major support.

Heavy industries tend to grow up adjacent to the railroad facilities while lighter industries seem to spread into other sections of the city.



# IOWA STATE PLAN INDUSTRIAL & RAILROAD AREAS



IOWA STATE PLANNING BOARD  
THE COMMITTEE ON ZONING & PLANNING

LEGEND  
CORPORATION LIMITS  
COMMERCIAL AREA  
INDUSTRIAL AND  
RAILROAD AREAS



# ● P L A N N I N G   A   B E T T E R   I O W A   ●

Des Moines	142,559	Ottumwa	28,075
Dubuque	41,679	Sioux City	79,193
Fort Dodge	21,395	Waterloo	46,191

Of the 89 cities of the second class, the following 19 have been zoned:

Ames	10,261	Lake City	2,012
Bettendorf	2,768	Marion	4,348
Boone	11,886	Newton	11,560
Creston	8,615	Perry	5,881
Emmetsburg	2,865	Red Oak	5,778
Forest City	2,016	Tipton	2,145
Grinnell	4,949	Valley Junction	4,280
Iowa Falls	4,112	Webster City	7,024
Jefferson	3,431	Winterset	2,921

From a study of the foregoing material it is quite obvious that the cities in Iowa have reached the stage where zoning is one of the essential elements in a program of orderly future growth. It is also obvious that more definite data should be on hand to guide the various local zoning committees in preparing their plans. To this end the committee decided to tabulate, from the plans of various cities studied, data which would shed some light on the various uses of the urban areas. Following the general classification of land use within boundaries, a determination was made of the percentage of land devoted to streets, residential, commercial, industrial and railroad uses, recreational uses, public and semi-public uses, and vacant land. The data compiled from these groups of cities are graphically pre-

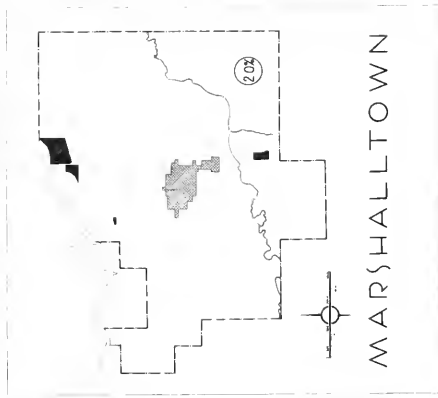
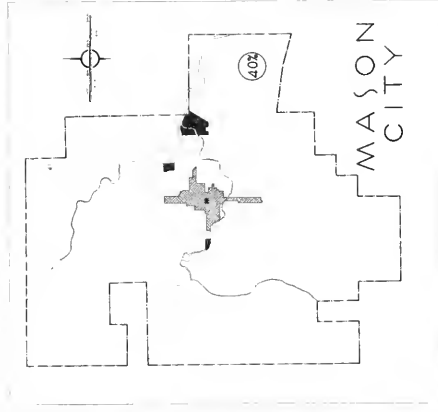
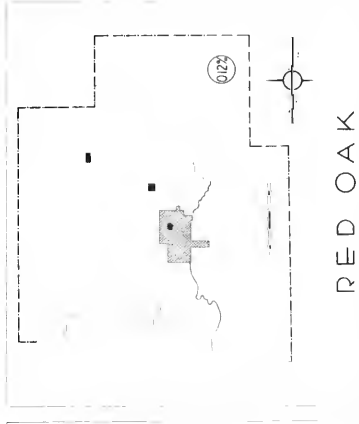
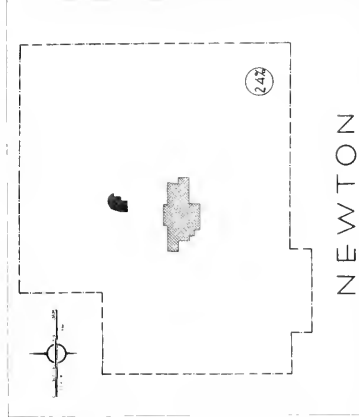
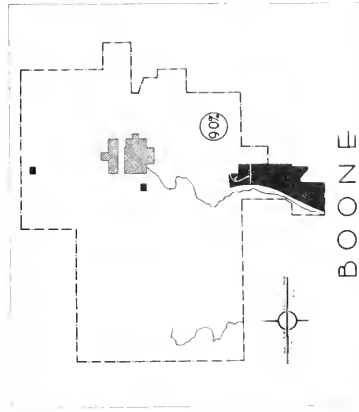
RECREATIONAL AREAS

Fig. 1042-6

Comparative percentage of town area devoted to recreation activity.

Revealing the comparative low percentage of area devoted to these essential uses and the lack of proper distribution.

# IOWA STATE PLAN RECREATIONAL AREAS



IOWA STATE PLANNING BOARD  
THE COMMITTEE ON ZONING & PLANNING

LEGEND  
CORPORATION LIMIT  
CITY LIMIT  
RECREATIONAL AREA



sented in Figures 1042-2, 3, 4, 5, 6, 7 and 8.

A comparison, between averages for 22 selected American cities of less than 300,000 population\* and the various Iowa cities studied, on a basis of the average per cent of the total area in various uses, is as follows:

Percentage of Total City Area

<u>Use</u>	<u>U. S. Cities</u>	<u>Iowa Cities</u>
Residential	23.8%	24.9%
Commercial	1.4%	2.3%
Industrial	3.7%	1.1%
Streets	20.2%	12.9%
Railroad property	3.2%	3.1%
Parks	4.0%	1.3%
Public and Semi-public	4.5%	2.4%
Vacant	39.8%	42.0%

The average per cent of developed area in each of the various urban uses for the same two groups of cities is as follows:

Percentage of Developed City Area

<u>Use</u>	<u>U. S. Cities</u>	<u>Iowa Cities</u>
Residential	39.3%	51.2%
Commercial	2.4%	5.0%
Industrial	5.9%	2.5%
Streets	33.6%	26.3%
Railroad property	5.5%	6.5%

Bartholomew, Harland, Urban Land Uses, Harvard University Press, Cambridge, 1932.

PUBLIC AND SEMI-PUBLIC AREAS

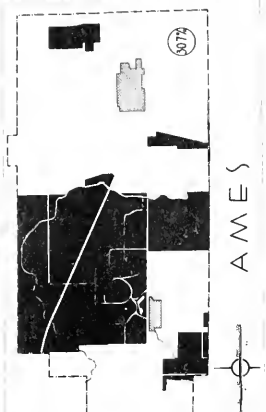
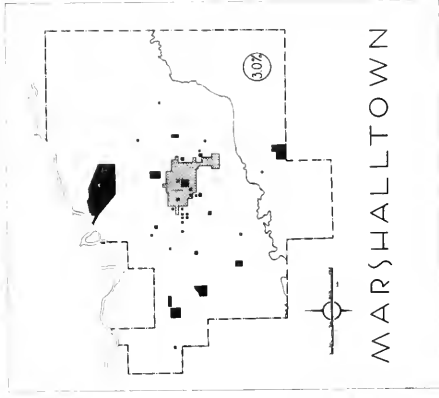
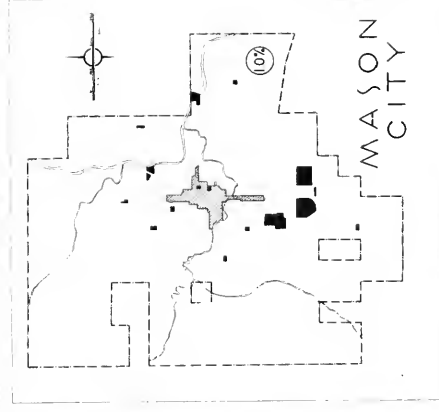
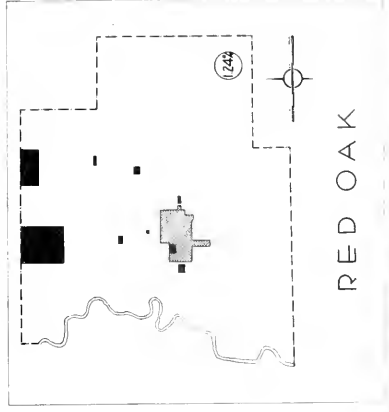
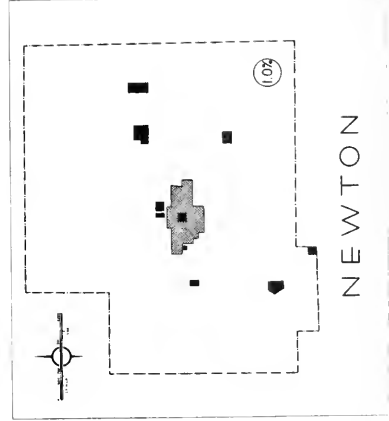
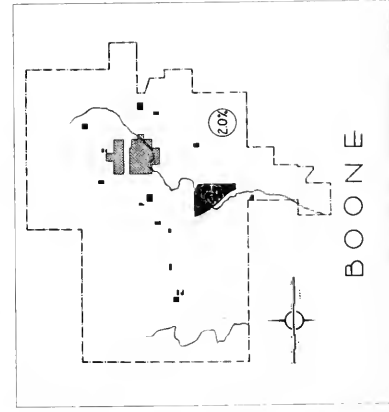
Fig. 1042-7

Comparative studies of location extent and distribution of semi-public area in selected Iowa towns.

The area occupied for such uses as town halls, libraries, and cemeteries is rather constant in extent for most towns and tends to increase proportionally with the population. The distribution varies with the type of city and the topography.



# IOWA STATE PLAN PUBLIC & SEMI-PUBLIC AREAS



IOWA STATE PLANNING BOARD  
THE COMMITTEE ON ZONING & PLANNING

LEGEND  
CORPORATION LIMITS  
COMMERCIAL AREA  
PUBLIC & SEMI-PUBLIC AREA



<u>Use</u>	<u>U. S. Cities</u>	<u>Iowa Cities</u>
Parks	6.3%	3.1%
Public and Semi-public	7.6%	5.4%

To give a general idea of how these various percentages appear on various town plats, the towns of Boone, Newton, Red Oak, Mason City, Marshalltown and Ames have been selected in which to show the areas occupied by these various types of urban uses. (See Figure 1042-9)

#### Wayside Parks

One of the recommendations of the Iowa Conservation Plan was for a network of comparatively small roadside picnic and camping parks.

The Submarginal Land Committee of the Land Policy Section of the U.S.D.A. has actively championed the Wayside Park not only as a part of its program of submarginal land acquisition, but as a new and widespread opportunity for supplying a greatly needed service to the American motorist, at the same time creating new employment.

These wayside parks are somewhat larger areas than the left over strips and parcels of land to be developed as minor resting places.

Often the wayside park will be a fine bit of upland wood with a brook, a distant view and restful shade. In extent these parks may vary from five to fifty acres, and eventually in many cases become real community parks. It is proposed to install water and sanitary facilities, safe and convenient parking areas, and in some a garden homestead for the custodian.

The areas selected for wayside parks should be similar in several respects. Each should be composed of land not suited for agricultural pur-

VACANT AREAS

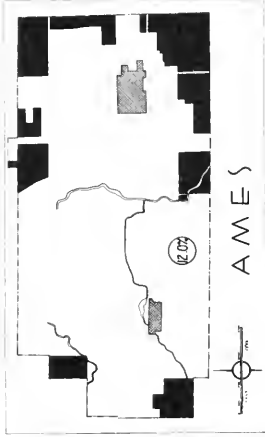
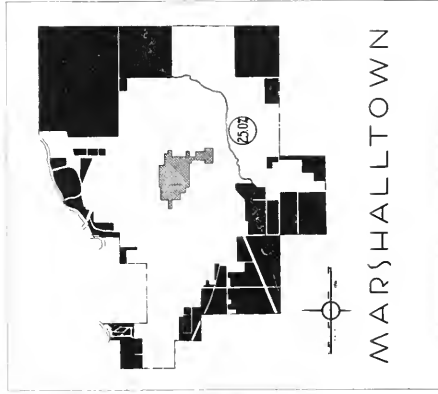
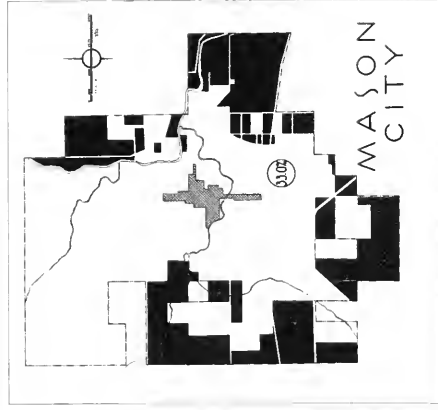
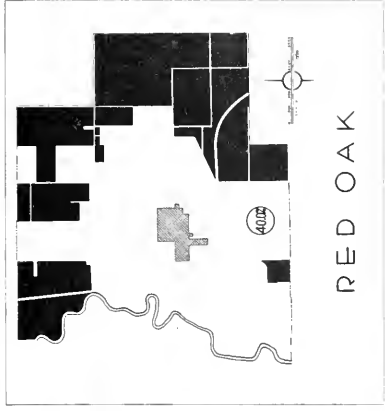
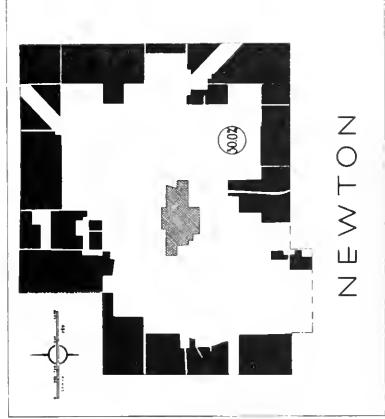
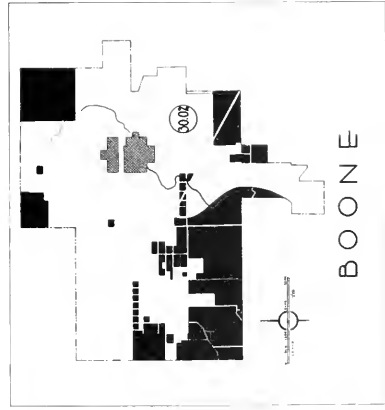
Fig. 1042-8

Location and per cent of town area unoccupied for urban use within town boundaries in selected Iowa towns.

These studies reveal the rather general trend of the growth of developed areas from the commercial center toward the town limits. In some cases the growing city divides around natural barriers, leaving vacant areas which could profitably be devoted to park and recreative uses.

# IOWA STATE PLAN

# VACANT AREAS



IOWA STATE PLANNING BOARD  
THE COMMITTEE ON ZONING & PLANNING

LEGEND  
CORPORATION LIMITS  
CITY AREAS (Hatched)  
VACANT AREAS (Black)



poses, and bordering on or very near to the highway it is expected to accommodate.

Whenever existing conditions make it possible, it is desirable that the areas serve two major highways and that they be not too near cities or large towns.

The probable use of sub-marginal lands for certain of these wayside parks brings them under the surveillance of the committee on Forests and Waste Lands. The fact that scenic improvement will be effected by their development places them within the category of Historic and Scenic functions. Both as a compromise measure and as a justifiable concession to the inclusive nature of regional and recreational planning, the subject of wayside parks is herein related to Project 1042, Zoning and Planning.

With the proper backing, and with their obvious desirability, wayside parks should be prominent among the tangible results of efforts toward large-scale planning.

Certain selected areas are shown on a state map (Figure 1042-11), and two typical sites--examples of those chosen--are illustrated (Figures 1042-12 and 13, and Pictures 1042-A and B).

#### Conclusions

The outstanding conclusions to be drawn from the field studies and office analysis of the data on both state-wide recreation and urban planning for Iowa suggest a need for:

1. Zoning plans and measures to hold the towns of the second class from further haphazard developments within their boundaries.

# URBAN LAND USE PERCENTAGES

Fig. 1042-9

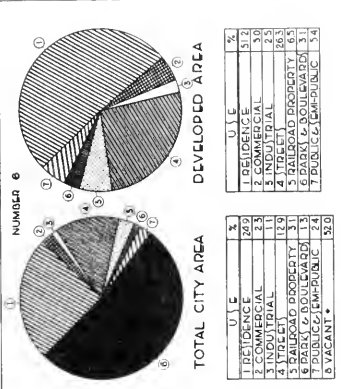
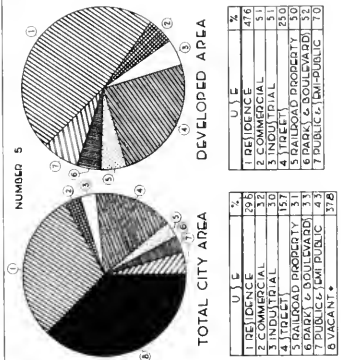
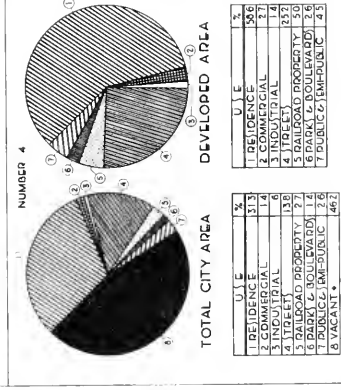
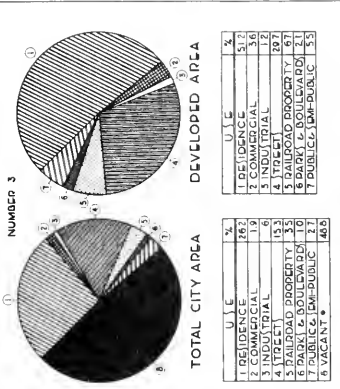
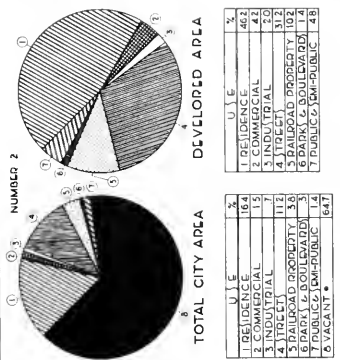
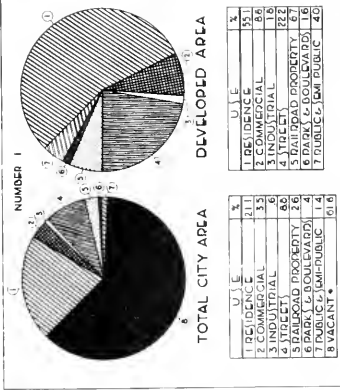
Charts and tables showing the per cent of total city area devoted to various uses and per cent of the developed area occupied for various uses.

The present percentage of area occupied for various uses in Iowa towns as compiled from these studies covering 124 Iowa towns reveals the following:

1. Residential use--Close to U.S. average.
2. Commercial use--Nearly double the U.S. average.
3. Industrial use--About half the U.S. average.
4. Street use--Considerable less than the U.S. average.
5. Railroad use--About the U.S. average.
6. Parks and parkways--One-third the U.S. average.
7. Public and semi-public--About one-half the U.S. average.
8. Vacant area--Nearly one-half greater than the U.S. average.



## IOWA STATE PLAN



GROUP NUMBER	POPULATION OF TOWNSHIP (CITE)
1	251-370
2	371-372
3	373-376
4	377-415
5	416-459
6 (TOTAL AVERAGE)	251-142,559

\* VACANT AREA NOT IN DEFINITE URBAN USAGE DOES NOT CONTAIN SCATTERED VACANT LOT

IOWA STATE PLANNING BOARD

AVERAGE PERCENTAGE OF LAND  
USED FOR VARIOUS PURPOSES  
... {ELECTED IOWA TOWN} ...

PREPARED BY  
THE COMMITTEE ON  
ZONING & PLANNING  
PROJECT  
1042

1042-9



2. Reducing the excess of land now wasted in commercial areas.
3. Building up and providing for light industries.
4. Increasing the recreational areas both urban and rural.
5. Developing within the counties and within the state a more equal distribution of diverse recreational facilities.

#### RECOMMENDATIONS FOR FURTHER WORK

Our studies have definitely indicated the need for city planning in the second class cities and towns, with a particular need for zoning plans to hold in check developments not required or warranted from an economic or esthetic standpoint.

Further studies should be made from the field data on hand to supply local communities with additional measuring standards both quantitative and qualitative in order to gauge the future planning and zoning programs.

Some of the measuring standards obviously necessary in Iowa pertain to:

1. Ratio of total developed area to population and total city area.
2. Ratio of single-family buildings and area to population.
3. Ratio of single-family area to total city area and to developed acreage.
4. Ratio of residential area to total city area and to developed acreage.
5. Comparison of dwelling types in residential areas.
6. Ratios of commercial buildings and area to population.
7. Ratio of commercial area to total city area and to developed acreage.

# WAYSIDE PARKS

Fig. 1042-11

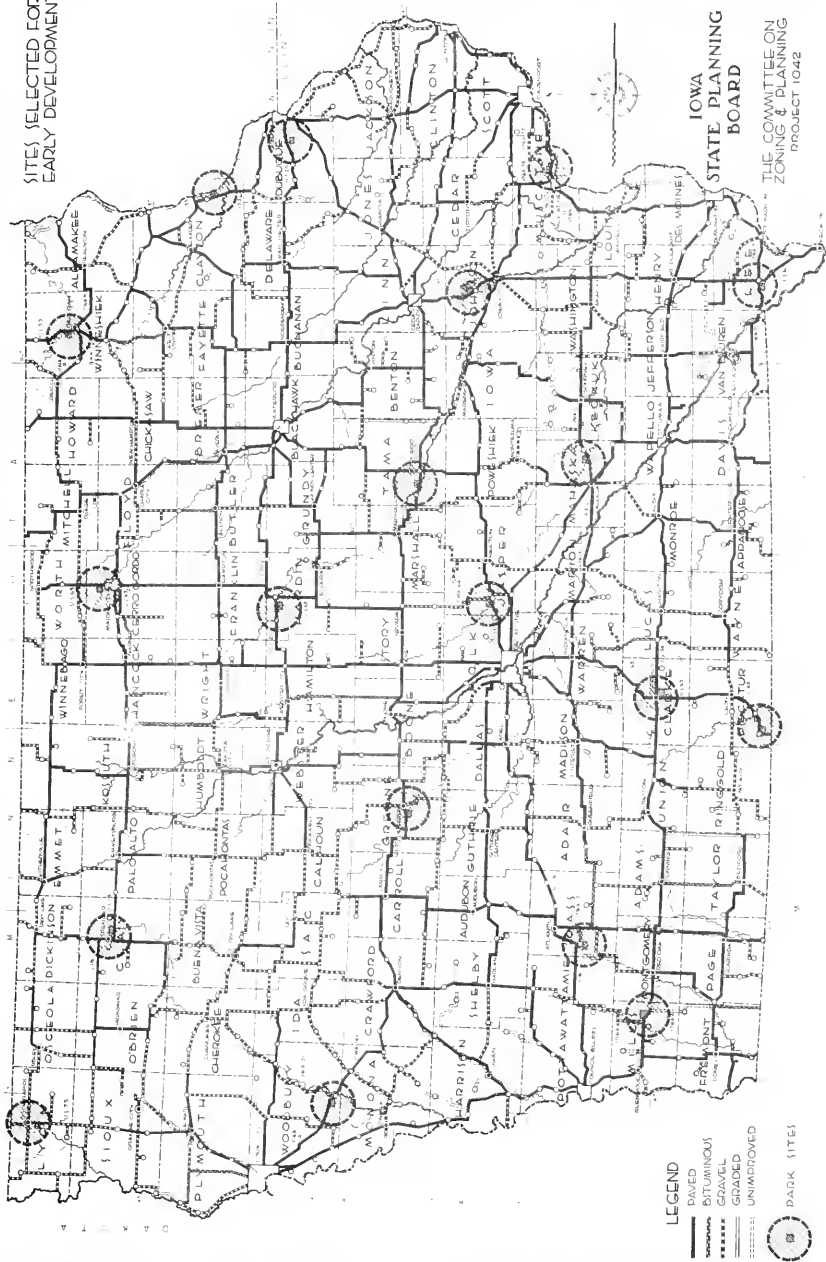
The opposite map indicates the selected sites for nineteen wayside parks in Iowa. Several of these were chosen from the many suggested in the "Twenty-Five Year Conservation Plan For Iowa". Of the nineteen indicated, ten have been surveyed including the ones near Spencer, Smithland, Jefferson, Guttenberg, Dubuque, Osceola, Oskaloosa, Lamoni, Montour and Muscatine. Preliminary studies of two selected examples follow.

# IOWA STATE PLAN

## WAYSIDE

## PARKS

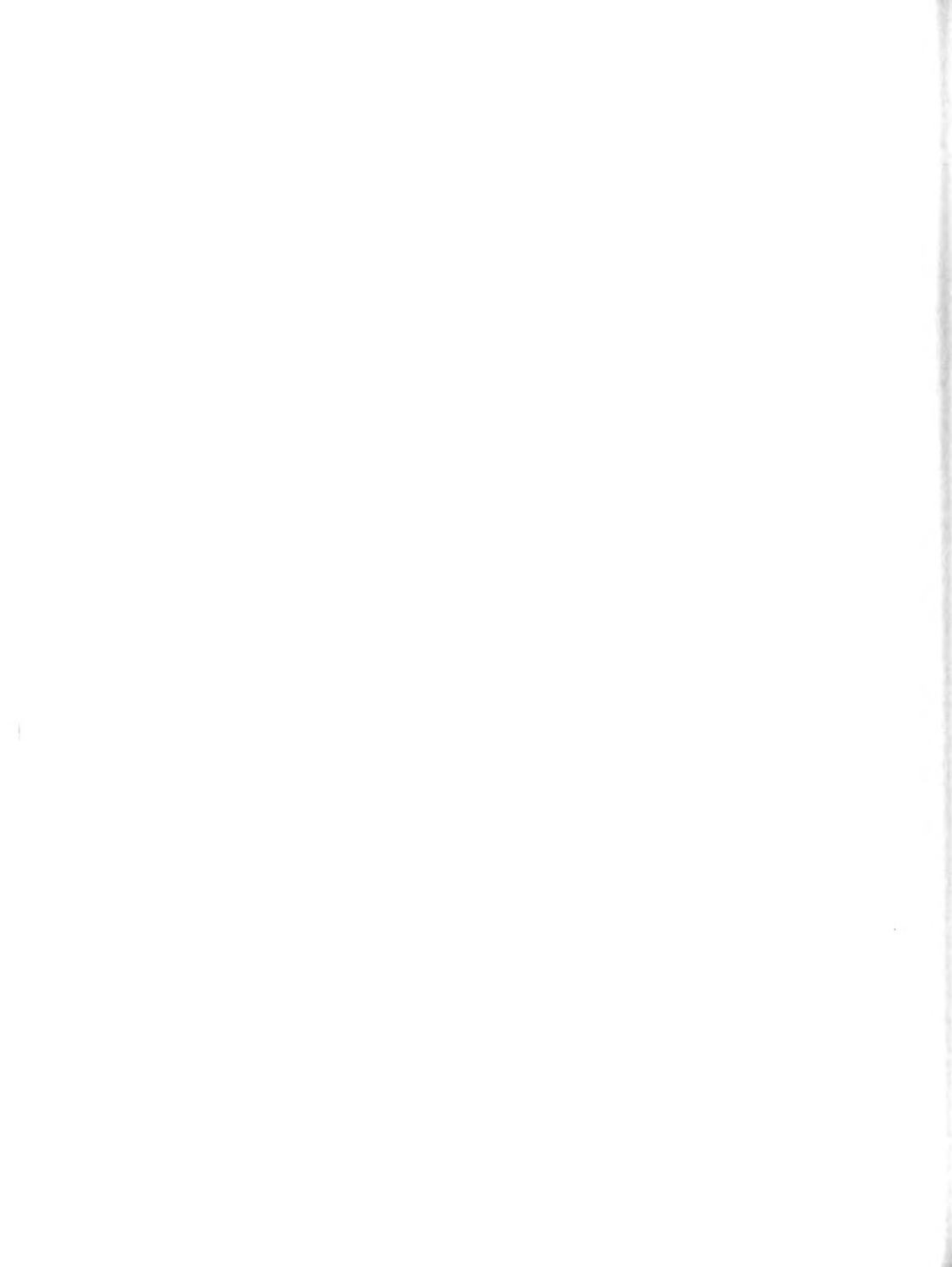
SITES SELECTED FOR  
EARLY DEVELOPMENT



IOWA  
STATE PLANNING  
BOARD

THE COMMITTEE ON  
ZONING & PLANNING  
PROJECT 1042

1042-11



8. Ratio of specific foot frontage use to commercial area and to population.
9. Ratio of light industrial areas to total city area and to developed acreage.
10. Ratio of street area to total city area and to developed acreage.
11. Ratio of park and playground area to total city area and to developed acreage.
12. Ratios of public and semi-public areas to total city area and to developed acreage.
13. Ratio of vacant area to total city area.
14. Ratio of all land use areas to population.
15. Determination of the mean average developed area per 100 persons.

Through the cooperation of FERA and other relief agencies with local, urban, city plan, or zoning commission, utilizing local unemployed, detailed existing use maps should be made during the coming winter, and city and zoning plans should be prepared. These plans should be prepared under the direction of the state planning director-consultant and qualified assistants.

Further studies should be made in the recreational field from a statewide standpoint. Recreational area should be classified in accordance with the needs and uses, and from data on hand definite plans should be prepared for the future acquisition and development of areas of each class: (1) on a statewide basis, (2) on a county basis, and (3) on a city or town basis.

Regional planning, under present political units, is perhaps best accomplished state by state--with inter-state coordination in order to

#### OSKALOOSA WAYSIDE PARK PLAN

Fig. 1042-12

Eight miles east of Oskaloosa, in Mahaska County, along Iowa Highway #2 is a tract of nine and one-half acres that offers a very desirable site for a wayside park. The tract is bordered by the highway and the South Skunk River.

#### OSKALOOSA AREA

Picture 1042-A

The upper view of the area proposed as a wayside park in Mahaska County is taken from across the river. The lower illustration shows the landscape toward the southwest as seen from the top of the bluff.

#### GUTTENBERG WAYSIDE PARK PLAN

Fig. 1042-13

This area of approximately thirty acres is located about two miles south of Guttenberg above the Mississippi River and about forty rods east of U. S. Highway #55. It is undoubtedly one of the choice sites in the entire state for such a park.

#### GUTTENBERG AREA

Picture 1042-B

These two views are from the Guttenberg (Clayton County) area contemplated for a wayside park development. The upper looking toward the southeast and the lower toward the northeast, show respectively a part of the Mississippi River and a section of the highway leading into the town.

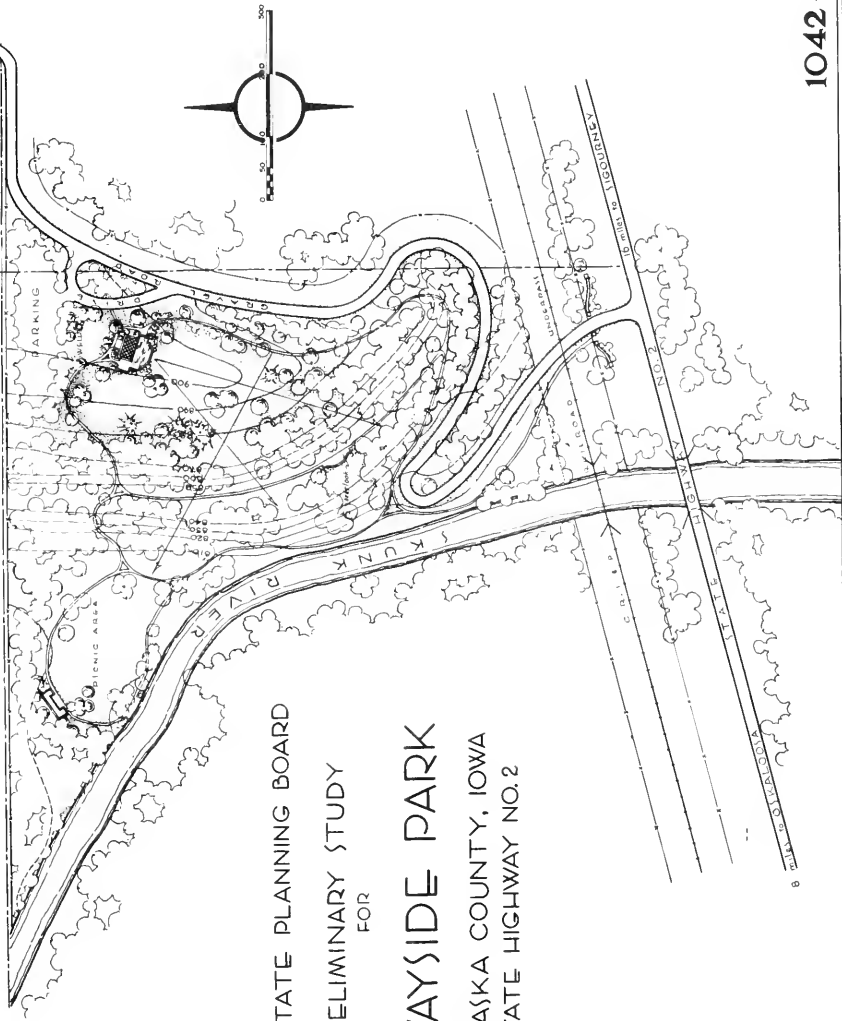


IOWA STATE PLANNING BOARD

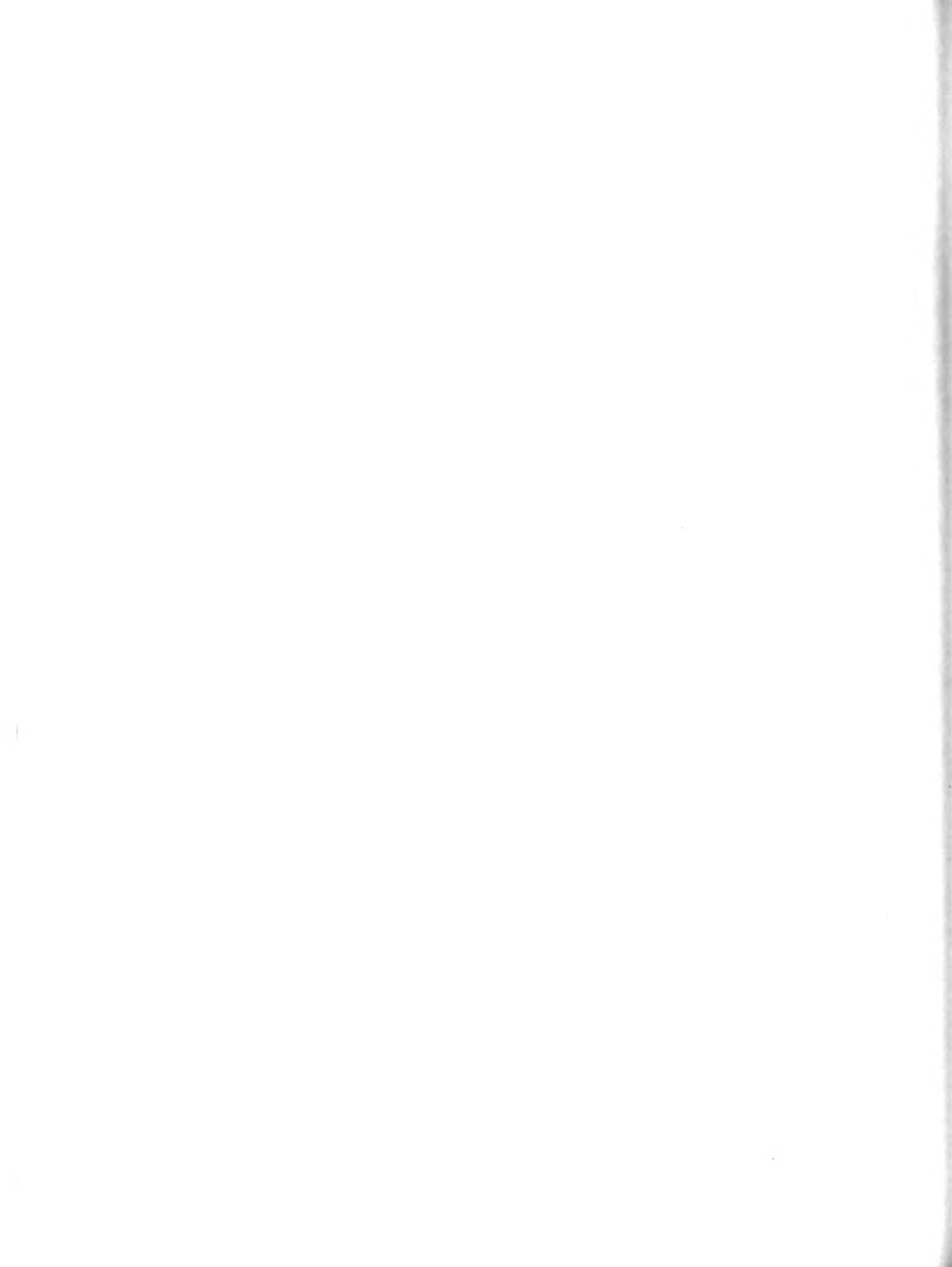
PRELIMINARY STUDY  
FOR

# A WAYSIDE PARK

MAHAASKA COUNTY, IOWA  
STATE HIGHWAY NO. 2



1042-12



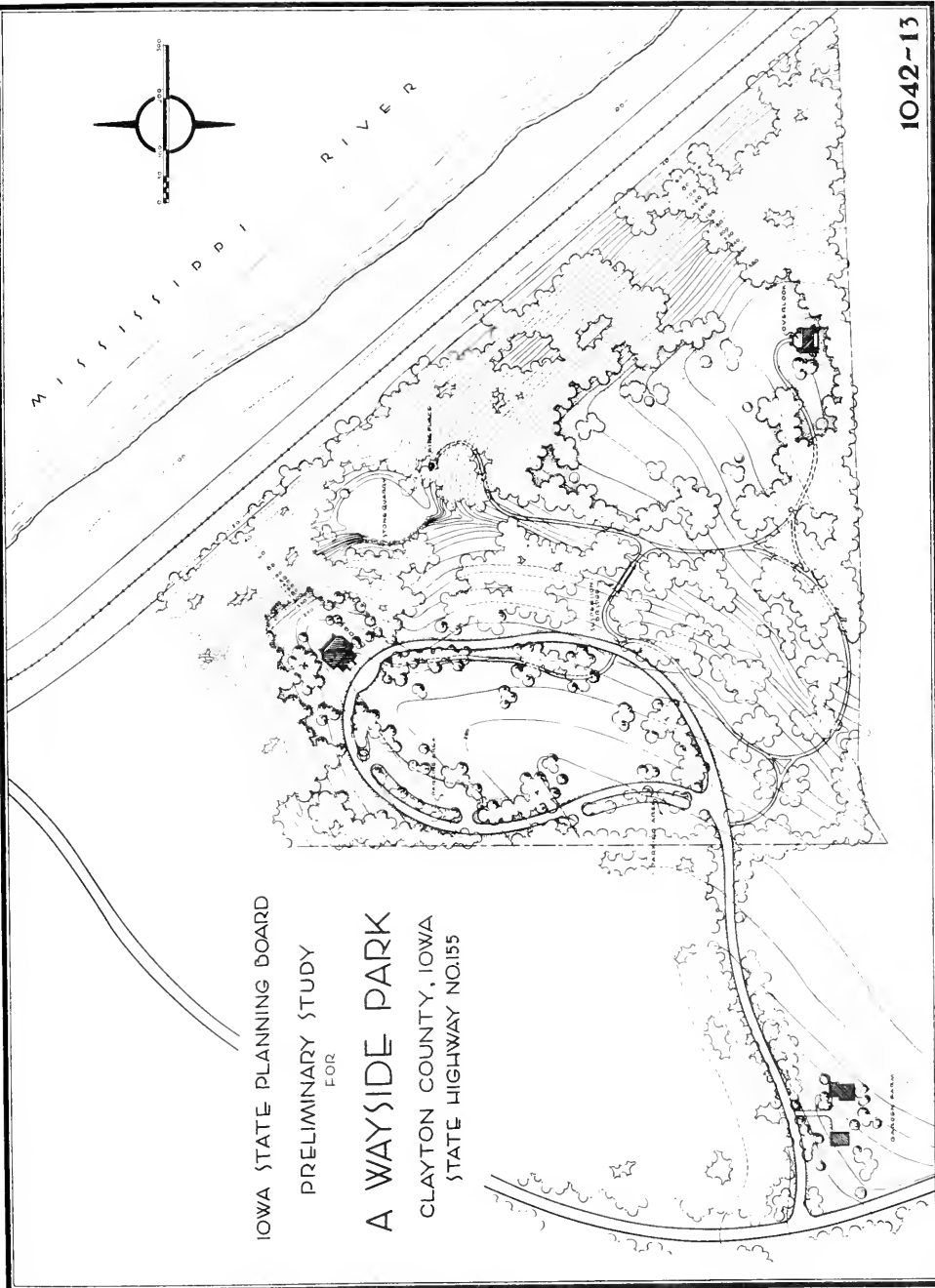


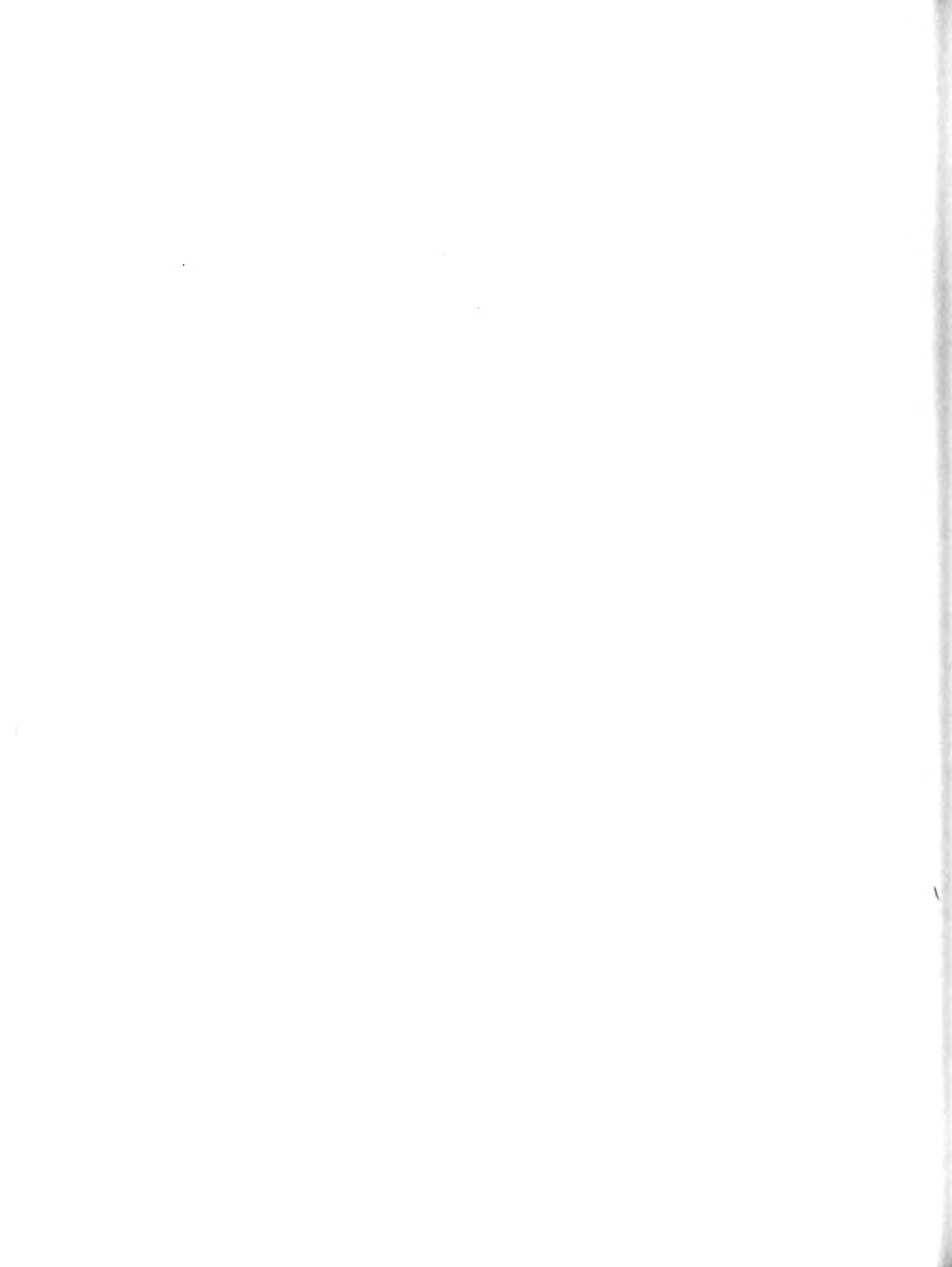


IOWA STATE PLANNING BOARD  
PRELIMINARY STUDY  
FOR

# A WAYSIDE PARK

CLAYTON COUNTY, IOWA  
STATE HIGHWAY NO. 155











gain integral results for larger areas. There is also a place for the county unit in acquiring and developing recreational areas. The city and town will continue to be privileged and responsible in the matter of providing space and facilities for recreation.

PUBLIC RELATIONS

Project 1049

PLANNING BOARD COMMITTEE

Mrs. H. S. Vincent, Chairmen, Fort Dodge  
H. H. Kildee, Dean of Agricultural Division, I. S. C., Ames

-----  
PROJECT SUPERVISOR

Mrs. H. S. Vincent, Fort Dodge

-----  
TECHNICAL ADVISERS

Grant Caswell, President of Iowa Newspaper Association, Des Moines  
Blair Converse, Head of Journalism Department, I. S. C., Ames  
Gardner Cowles, Jr., Managing Editor Des Moines Register, Des Moines  
Lester Milligan, Mason City -- Granger P. Mitchell, Editor, Fort Dodge  
Fred Pownall, University of Iowa Editor, Iowa City  
Harry Shaw, Editor, Waterloo                      Mrs. F. W. Weitz, Des Moines  
A. H. Wieters, State House, Des Moines

COORDINATOR

Alvin E. Coons, Ames

## WORK OF THE PUBLIC RELATIONS COMMITTEE

A favorable public opinion is vital to any program as ambitious as that of the Iowa State Planning Board, if that program is to succeed.

To the public relations committee has been assigned the task of writing, editing and transmitting to the press the important news and educational features incidental to the work and publicity of the State Planning Board, or supervision of the same, to properly acquaint the people with the work as it progresses and to compile records of the various planning activities in the state.

### The Field

Principal outlets for educational information concerning this board are (1) the daily, weekly and monthly press, (2) the radio, and (3) speaking engagements for board members.

As soon as the Public Relations coordinator began his work the latter part of May he established contacts with the leading news agencies in Des Moines, namely, the Associated Press and the United Press. These two organizations serve the 45 daily papers of the State. Mr. Porter Hedge of the Associated Press has given the board especially good cooperation.

Contact was also established directly with all of the 45 daily papers through a personal letter and mimeographed copies of all the important facts concerning the planning board, this material to be filed in their libraries to be used in checking names, etc. in stories sent out from time to time.

Through the courtesy of the Bulletin Office and News Bureau of Iowa

State College it was possible to get their mailing list of more than 300 weekly papers in the state. These papers have received materials from time to time when some phase of the planning board directly concerned the work in their vicinity.

The Des Moines Register, which serves virtually the entire state, has used the most material, publishing two detailed stories about the board, both with illustrations, and numerous shorter articles on the work of the various projects.

In all, 36 major stories concerning the board have been sent out, as well as numerous small items. These stories, in many cases where the material was handled by the Associated Press, have appeared in some 20 papers.

A scrap book has been kept of as many of these stories as are available. However, since the planning board has no fund for a clipping service, it has been impossible to get all of these stories as they appeared. The coordinator has had to rely upon the clipping service of Iowa State College, from which only clippings that specifically mentioned those board members connected with the college could be obtained; and, upon the library at Iowa State College which, in the instances of some papers, will allow clipping after one month.

In many cases it has not been thought advisable to give publicity to some of the work of the various committees, notably, those dealing with the possible purchase of land, because it was feared that premature publicity might lead to undue difficulties.

The committee has the assurance of the Associated Press and the Des

Moines Register that the material of the preliminary report will be very much in demand as soon as it can be released.

To date, three radio addresses have been given over WOI, the Iowa State College station which covers the entire state. The first broadcast on May 22 was a discussion of the National Planning Board setup. The second, on June 12, dealt with the setup of the Iowa State Planning Board and its relationship to national planning. The third broadcast on August 28 was a review of some of the materials obtained in the village and housing survey of the Planning Board.

Due to the fact that speakers are in very little demand during the summer months, little emphasis has been placed upon obtaining speaking engagements for board members. However, with the preliminary report out of the way, and the approaching fall and winter season, this part of the public relations should receive more emphasis in the program.

#### Plans for Continuation

With the completion of the first six months period, and the submission of the preliminary report, there should be a great deal of additional material for publicity.

A conference has already been arranged with the staffs of Meredith Publications on housing. These papers are putting on a drive for improved housing conditions, and will make use of the findings of the Planning Board committees on that subject.

The coordinator is at the present time arranging for a series of broadcasts over WOI on the materials of the first six months report of the board.

The National Broadcasting Company, in its Farm and Home Hour, has asked for a seven minute broadcast on planning in Iowa.

Soon after the formation of the board, the matter of putting out a Primer of Planning, for the purpose of popularizing planning, was brought up. During the first six months period, however, the material for such a book was hardly available.

However, with the wealth of material that has been collected during the first period, including some excellent pictures which would serve as suitable illustration, it should be possible to prepare a 16 or 32 page bulletin on planning for distribution and use in courses in Agriculture and others.

## LEGISLATION

### Temporary Committee

A. E. Rapp, Chairman, Council Bluffs  
Mrs. Henry Frankel, Des Moines  
Fred White, Ames  
P. F. Hopkins, Des Moines

### Present Iowa Planning Legislation

The various phases of a planning program necessitate a consideration of the legislative problems which are involved in such a broad undertaking. The source of authority for any planning activity must be the state legislature, for it is from this source that all state authority emanates.

The application of the laws which are in existence, and those which are contemplated, must be studied in the light of the benefit bestowed upon the citizens of the state. The Police Power of the state--that power to provide for the protection of the health, safety, morals, and general welfare of the people is the basis for the enactment of such legislation. Unless the legislation enacted by the law making body is within this Police Power, as determined by the decisions of the courts, it will not be upheld by the courts.

The first element of our problem comprises the statutes which we now have in effect in our Code, bearing upon the principle elements of the Planning Program, and which we must study in order to determine what additional enactments are necessary to further such a program. The present laws of Iowa bearing upon phases of the program under consideration are:

(1) An act enabling any city or town to enact ordinances regulating and restricting the height, number of stories and size of buildings and structures.

(2) An act authorizing cities of 15,000 or more population to adopt ordinances regulating and controlling Housing--setting up minimum requirements for Light and Ventilation, Fire Protection, Alterations, Maintenance, Improvements, and certain other requirements--and providing remedies for violations.

(3) An act authorizing cities and towns to create planning commissions for the purpose of planning for their future development; and acts bearing upon the subjects of Restricted Residential Districts, Permanent Park Boards, Park Commissions, and Plats for cities and towns.

#### Suggestions for the Future

After a brief study of existing statutes, it is possible at this time to make only a few suggestions for future legislative development. Suggestions would include:

(1) An act creating a Permanent State Planning Board must be enacted to provide for the preservation and proper planning of the use of the resources of the state.

(2) The present zoning enabling act might be revised to make it possible for counties to zone. This would give control of subdivisions outside of the city limits of all cities and towns.

(3) The State Housing Law might be enlarged upon, or a separate act might be enacted authorizing and regulating Public and Private Housing Corporations, in order to provide better housing conditions for the poorer



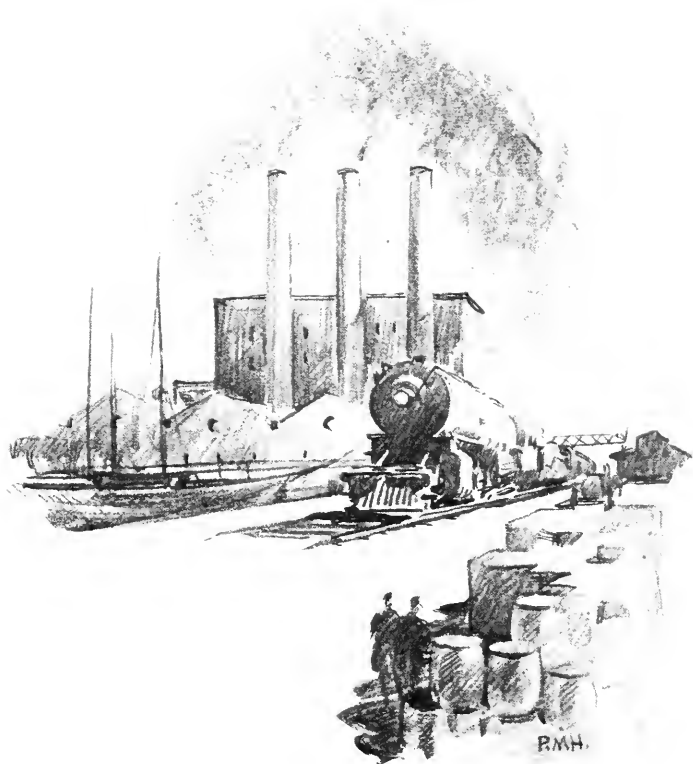
class of people and better to provide for utilization of Federal funds for such purposes.

(4) The present act authorizing City Planning Commissions might be revised to provide for the acceptance of recommendations made by the State Planning Board and to give the C.P.C. more definite powers.

(5) An act authorizing the purchase of lands for state and other forests, and the regulation and control thereof, might be enacted.

Since legislation is a result of public opinion as expressed by the State Legislature, the ultimate power lies with that body. These suggestions are made merely to show a few possibilities for future development tending to provide a better planned Iowa.





COMMERCE

## TRANSPORTATION

Project 1036

### PLANNING BOARD COMMITTEE

Fred White, Chairman, Chief Engineer State Highway Commission, Ames  
Mrs. Henry Frankel, State Board of Conservation, Des Moines  
William P. Woodcock, Chairman State Board of Conservation, Spencer

-----

### PROJECT SUPERVISOR

W. O. Price, Engineer, State Highway Commission, Ames

-----

### TECHNICAL ADVISERS

T. R. Agg, Dean of Engineering Division, I. S. C., Ames  
W. A. Bevan, Professor of Mechanical Engineering, I. S. C., Ames  
E. B. Butler, Traffic Representative of United Airways, Des Moines  
Charles M. Gatchett, State Board of Aeronautics, Des Moines  
W. E. Hall, Managing Editor Mason City Globe Gazette, Mason City  
R. B. Kittridge, Professor of Transportation Engineering, S. U. I., Iowa City  
Sidney L. Miller, Professor of Transportation, S. U. I., Iowa City  
Ralph A. Moyer, Professor of Highway Engineering, I. S. C., Ames  
C. L. Person, Asst. Ch. Engr., C. B. & Q. Railroad, Chicago, Illinois  
F. E. Richardson, Chief Engineer, Great Lakes Pipe Line Company, Kansas City

### COORDINATOR

Anson Marston, Senior Dean of Engineering, I. S. C., Ames  
(State Highway Commission)

## WORK OF THE TRANSPORTATION COMMITTEE

As now in progress, and as at present planned for the future, the work which the Transportation Committee of the Iowa State Planning Board must do to accomplish its task is considered to be about as follows:

### Objectives

The objectives are considered to be (1) to plan the most highly efficient, coordinated future Iowa transportation system, including all agencies, practicable of realization within 25 years; (2) to prepare definite 10-year construction programs, in harmony with the 25-year plan, for all existing and prospective Iowa transportation agencies.

It is now considered that the program of the committee's work should extend over about 12 months.

The committee plans to coordinate its work closely with that of other national and state agencies. To this end, the Iowa State Highway Commission's coordinator of transportation agencies has already made personal contact in Washington, D. C., with the Federal Coordinator of Transportation, the Chief of the U. S. Bureau of Public Roads, the Executive Officer of the National Resources Board, and with the Director of the Highway Research Board of the National Research Council.

### Researches

The committee is making cooperative contacts with representatives of the public and of Iowa industries and business in all sections of the State, and with representatives of all existing and prospective Iowa transportation

agencies. For all classes of Iowa transportation, workers are endeavoring to collect data of volumes, character, costs and needs.

The Transportation committee is promoting the early start of a master traffic survey, 24 hours per day, financed mainly by Federal relief funds, on one of Iowa's most heavily traveled highways. The committee's coordinator has arranged for a national study, under the direction of the National Research Council and financed by the U. S. Bureau of Public Roads, of the length at actual service before reconstruction, of different types of highway surfaces.

The committee is undertaking transportation studies, such as those of: principles; improvements; financing methods; costs; equitable charges; equitable distribution of charges.

The results of the committee's preliminary studies of the various existing Iowa transportation systems are presented below.

#### THE IOWA RAILWAY SYSTEM

Iowa's railway system is shown in Figure 1036-1, on which different symbols are used to distinguish between the main lines, the principal branch lines, the minor branch lines and abandoned lines.

Note. The classification shown is based mainly on present volume of traffic and is somewhat arbitrary.

The mileages of the different classes of railway lines shown in Figure 1036-1 are approximately as follows:

TABLE 1036-A

THE IOWA RAILWAY SYSTEM

Main Lines - - - - -	3,627 Miles
Principal Branch Lines - - - - -	1,806 Miles
Minor Branch Lines - - - - -	4,637 Miles
Total Present (1934) System - - -	10,070 Miles
Abandoned Branches - - - - -	408 Miles
Total Original System - - - - -	10,478 Miles

Historical Development

The first railway in Iowa extended from Davenport to Iowa City, then the State Capital, and was built in 1855. The predecessors of the present Rock Island, Burlington, Illinois Central, Chicago and Northwestern and Milwaukee railway systems all reached the Mississippi River from the east between 1854 and 1857. From the Mississippi River the early Iowa railways reached westward with the advance of settlement. They were designed and built by fiercely contending private companies, originally financed or soon absorbed by powerful groups of eastern financiers, fighting each other for territory and for bonuses from the public. In 1857, public debts incurred for helping railroads and other private corporations already amounted to more than \$7,000,000. In 1860 the western termini of four of the present principal railways were at Ottumwa, Iowa City, Cedar Rapids and Independence.

The Iowa railway net was feverishly extended westward after the Civil War, and three of the present main east and west through lines had reached the Missouri River by 1870. The steam railway system was practically completed by 1890. A number of electric railways were added later, and the peak of total mileage was reached in 1914.

# RAILWAY SYSTEM

Fig. 1036-1

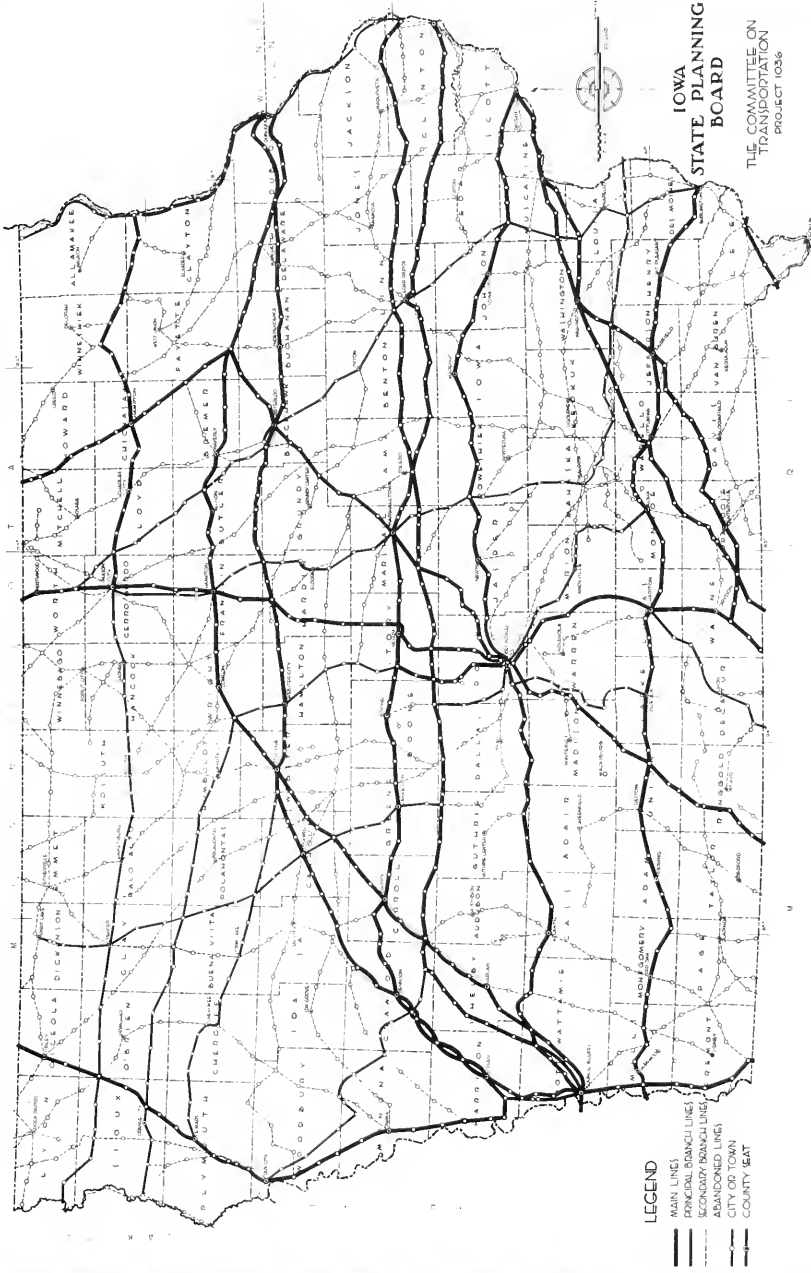
This map shows the complete railway system of Iowa, arbitrarily divided into three general classes; Main Lines, Principal Branch Lines and Minor Branch Lines. Many of the minor branches operate only one mixed train per day. In some cases there are no scheduled trains.

The map also shows the trackage which has been entirely abandoned during the past few years.



# IOWA STATE PLAN

# RAILWAY SYSTEM



## LEGEND

- MAIN LINES
- PRINCIPAL BRANCH LINES
- - - SECONDARY BRANCH LINES
- ... ABANDONED LINES
- CITY OF TOWN
- ★ COUNTY SEAT

IOWA  
STATE PLANNING  
BOARD

THE COMMITTEE ON  
TRANSPORTATION  
PROJECT 1036

1036-1



Owing to the combined effects of unwise original construction and the rapid development since 1913 of competing highway transportation agencies, approximately 408 miles of electric lines and branch steam railway lines have been abandoned.

General Plan of Iowa's Railway System

In a broad way, it may be said that Iowa's railway system consists mainly of a half dozen main lines, crossing the State on east and west parallels, distributed between her north and south boundaries, and constituting links in through lines of railway transportation between the states west of Iowa and those east; from each of which east and west main lines several comparatively long principal branches have been built, most often to the northwest or southwest, to serve as feeders, largely by getting business away from competitors, while numerous minor branches reach out from both the main lines and the principal branches to secure the business of adjoining local areas.

Upon the general system above described, the Chicago and Great Western was superimposed in 1885; with its main line extending from Chicago through Dubuque to Oelwein, and there dividing to reach St. Paul and Minneapolis to the north and Des Moines and Kansas City to the southwest, and with branch lines to Fort Dodge and Omaha.

The Iowa Railway System thus described was never comprehensively planned on the basis of any study of real state and national needs and regard therefore. It simply grew into its present form as the result of bitter contests between hostile financial groups, each planning and building wholly for its own financial profit. Neither the main lines nor the

branches serve the needs of the State for prompt north and south transportation; and the systems of local branches belonging to hostile lines left many communities without prompt transportation facilities to and from adjoining counties.

Note in Figure 1036-1 the numerous instances of closely parallel lines, where only one is really needed. Note the not uncommon situations, similar to those in Guthrie, Audubon and Shelby Counties, where communication by rail between adjoining county seats, between which highway travel now takes only 40 minutes drive, required roundabout railway connections and tire-some waits occupying a full day. Especially were the north and south transportation facilities unsatisfactory. A trip from Ames to Mason City and return, for example, took two or three days, if any business was to be transacted, where now one is amply sufficient by the highways. Tedious station waits and much trying night travel in day coaches were necessary in much of the intra-state travel on Iowa railways.

#### Competition Between Iowa Railways and Iowa Highways

Ever since 1913 the Iowa railway system, described above, has had to meet ever increasing competition with rapidly increasing numbers of automobiles, trucks and busses, operating over rapidly improving Iowa highways, carefully selected to form state and county highway systems scientifically planned to meet actual national and state transportation needs. The Iowa State highway system has been coordinated with those of adjoining states, in part through the Agency of the U. S. Bureau of Public Roads. The county systems have been coordinated with each other by the Iowa State Highway Commission.

More than \$360,000,000 has been invested since the World War in surfacing and otherwise improving these Iowa highways. Under the stress of this competition, the operation of an increasing number of branch railway lines came to be unprofitable, even before the start, in 1929, of the present great depression; and, upon request of the railway companies, 408 miles of railway have been abandoned, as indicated in Table 1036-A.

The question of whether further abandonments of Iowa railway branches may be advisable, and if so, to what extent, is one of the important problems to be solved in planning an efficient, coordinated future Iowa transportation system.

#### The Railway-Highway Grade Crossing Problem

The speed of railway trains, both passenger and freight, has increased greatly in recent years. Speeds as high as 100 miles per hour for special passenger service are a possibility of the future, and already are undergoing trial. Highway traffic has increased by leaps and bounds. Automobile speeds of 50 to 60 miles per hour are common, especially on paved roads. Railway-highway grade crossing accidents take heavy toll of highway passenger and driver lives, and are quite likely in the future to kill railway travelers also. The elimination of railway-highway grade crossings is a transportation problem of major importance.

Considerable elimination of railway-highway grade crossings has already been effected in Iowa, partly by highway realignment and partly by grade separations. This elimination has been mainly on the initiative of the Iowa State Highway Commission, under many difficulties due largely to lack of authority to proceed otherwise than by negotiating joint agreements on

all features of each elimination. Such public authority over crossing elimination as is now provided by law is divided between different public agencies.

The time seems now to have come for new legislation, simplifying and speeding the work of railway-highway grade crossing elimination, and providing adequately for its financing.

#### The Place Of Railways In The Future

The Transportation Committee approaches the planning of a coordinated future Iowa transportation system without any bias for or against any particular transportation agency. Undoubtedly, an adequate railway system, earning fair profits, must be one of the major components of an adequate, efficient, wisely coordinated state transportation system. However, every reasonable effort must be made to increase the efficiency and decrease the cost of transportation services, and it is not permissible to prevent, or even discourage, the development of other agencies which can render some transportation services better and cheaper than can railways.

Railway studies which should be made by the Transportation Committee include:

#### The Character and Speed of Future Railway Passenger Transportation:

Is it to be at higher speeds; up to say 100 miles per hour?

Is it to be station to station, as now, or door to door?

At how frequent stations must railway trains collect and deliver passengers?

What improvements are feasible in the comfort and convenience of passenger service?

To what extent shall railways own and operate highway busses?

The Character and Speed of Future Railway Freight Transportation:

Is it to be at higher speeds; and how fast?

Is it to be station to station or door to door?

To what extent, if at all, shall highway truck service be substituted for branch line service?

Who shall own and who operate trucks engaged in joint railway-truck service?

The Extent of Wise Abandonment of Unprofitable Branch Railway Lines:

Shall provision of adequate joint railway-truck services be required as a requisite for permits?

The Extent, Character, Chronology and Financing of Future Railway Construction Work:

Grade crossing eliminations.

Reconstruction of main lines made necessary by higher speeds and/or greater weights.

Improved rolling stock; and its costs.

Unification and improvement of station and terminal facilities.

The beautification of railway properties.

#### THE IOWA HIGHWAY SYSTEM

There are 102,417 miles of Iowa rural highways, mostly located on north and south or east and west land lines, and averaging about one mile apart in each direction. These are now grouped into three highway systems, state primary, county trunk, and county local, with mileages as shown in Table 1036-B.

TABLE 1036-B  
IOWA HIGHWAY SYSTEMS

January 1, 1934

State Primary Roads - - - - -	7,834 Miles
County Trunk Roads - - - - -	13,211 Miles
County local Roads - - - - -	<u>81,372 Miles</u>
Total Iowa Highways	102,417 Miles

Five charts of Iowa highways are included in this report.

Figure 1036-2. The Iowa State Primary Road System

Figure 1036-3. Cerro Gordo County Road Systems

Figure 1036-4. Bus-Line Routes over Iowa Highways

Figure 1036-5. Inter-State Truck-Line Routes over Iowa Highways

Figure 1036-6. Intra-State Truck-Line Routes over Iowa Highways

### History of the Development of Iowa Highways

The early highways of Iowa consisted of two different classes of roads:

1. A few long-haul dirt roads, located as thought most advantageous, mostly reaching westward from the main Mississippi River ferries. Over these, the long lines of emigrant wagons passed. At intervals, pioneer taverns provided rough accommodations for travelers. As settlements progressed westward, goods and products were hauled in wagons over these roads, from and to the river shipping points, for inland distances up to 150 miles.

2. A multitude of local dirt roads, mostly located on the north and south and east and west land lines. These afforded the settlers that road access service which was essential to the development and is essential to the continued use of their farms.

The main authority over the roads and culverts was vested in the township



officers. Township road taxes were mostly payable in labor, which was neither well directed nor efficiently rendered. The county supervisors built most of the bridges, and as time passed they came to do increasing amounts of road work, paid for by the proceeds of county road taxes. They decided where to do road work at their pleasure, often for political reasons, or even for personal benefits, but also often with faithful regard to the public interests. There was no state control or construction of roads or bridges.

These administrative conditions, inherited from the eastern states whence the emigrants came, were fairly well adapted to the scanty resources and the minimum essential needs of pioneer days; but they proved to be entirely incapable of providing the administrative and technical skill necessary for the construction and maintenance of the highways required by later modern highway traffic.

For 75 years after the settlement of the State began, little permanent road improvement was accomplished. Even the bridges were flimsy and impermanent. The roads were practically impassable for considerable periods each year. In spite of the integrity of most public officers, numerous serious abuses and not infrequent public scandals were prevalent in connection with road and bridge work, both by contract and by day labor, and especially in connection with contracts for culverts, bridges, materials and equipment.

Aroused public sentiment against these conditions led, in 1904, to the adoption of a state law that the Iowa State College "shall act as a highway commission for Iowa". The two deans upon whom the College placed the

PRIMARY ROAD SYSTEM

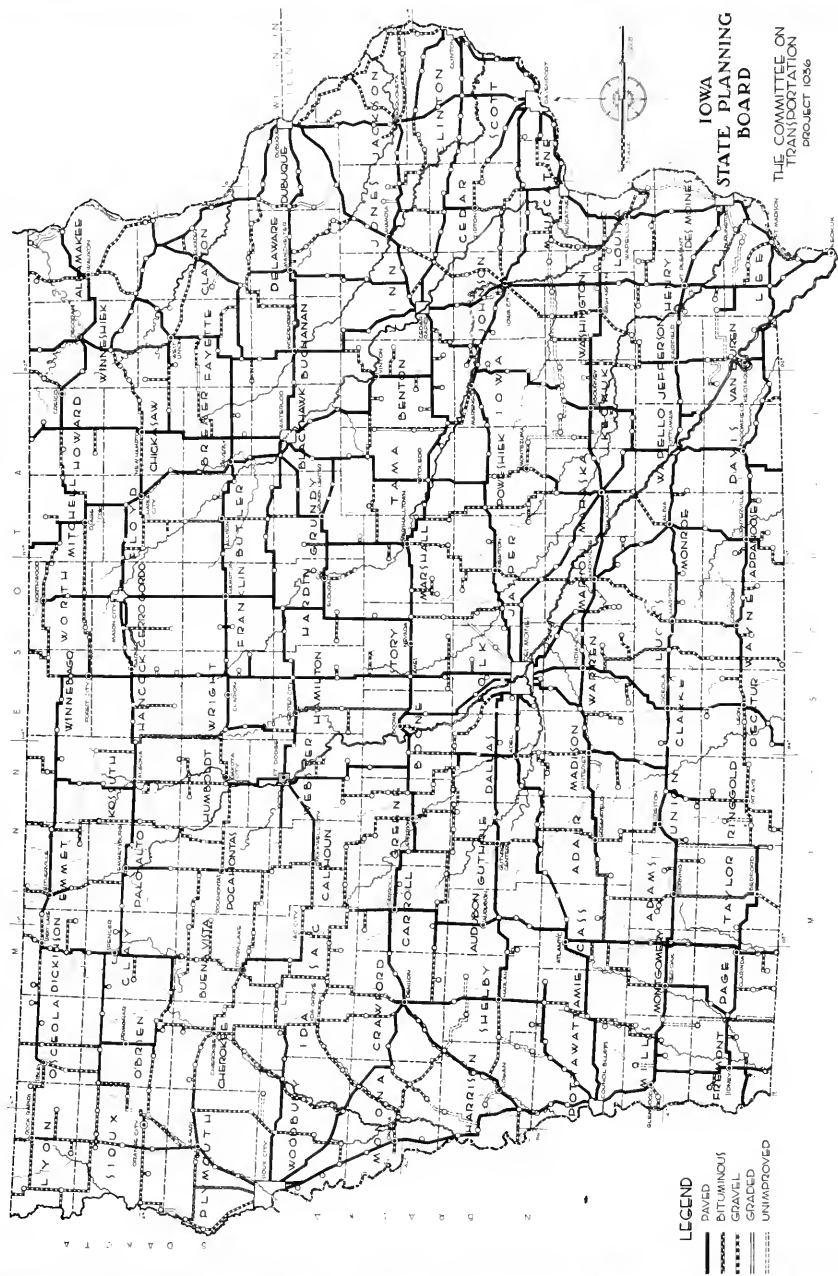
Fig. 1036-2

The Iowa Primary Road System comprises 7834 miles of main roads, all built and maintained by the Iowa State Highway Commission. Of this mileage, there were 4202 miles paved with brick or concrete as of January 1, 1934. All of these roads are maintained in first class condition throughout the year. Snow removal equipment is operated during the winter months.

# IOWA STATE PLAN

## PRIMARY

## HIGHWAYS





responsibilities imposed by this law were fortunate enough to employ at once Mr. T. H. MacDonald, now Chief of the U. S. Bureau of Public Roads (but then just graduated from college) as their engineer. With very slight resources, and with only advisory authority, the Highway Commission thus constituted rendered services of such value, that in 1913 the Iowa Legislature passed a law creating a new State Highway Commission, with wide authority and ample resources, located at the Iowa State College (later at Ames), of three members, one of them ex officio the Dean of Engineering at the College. The 1913 highway law provided further for the compulsory employment by each county of a competent county engineer, who must have charge of the county highway work and approve the bills therefore. The law also provided for setting aside, in each county, of a county system of highways, completely removed from township jurisdiction, not exceeding 15% of the county's total road mileage. These county highways were selected by the State Highway Commission, after receiving from each county the recommendations of its supervisors. The county systems were coordinated by the Commission into a carefully planned State highway system of county financed roads and originally including about 13,000 miles of roads.

The 1913 highway law was revolutionary in that, for the first time in Iowa, it made a centralized state authority predominant in many phases of highway administration, construction and maintenance over the authority of county and township road officers, many of whose time honored functions were transferred to the State Highway Commission and to the county engineers.

Since 1913, the improvement of Iowa highways has progressed rapidly.

The first great accomplishment was in the design and construction of

highway culverts and bridges, for all of which in the State the Highway Commission now made standard plans and specifications; and which were now required to be let by contract to the lowest responsible bidder.

Contrary to the early practice in most other states, work on the improvement of the roads themselves was at first concentrated mainly on draining them and grading them to engineer's plans; to construct good foundations for the later surfacing. Improvement by realignment was undertaken actively. The first road surfacing was mainly by gravel. Very little paving was undertaken before 1919, in which year it began in earnest as the result of the adoption of a new State law, termed the "primary road law".

The primary road law of 1919 provided that the Highway Commission should select roads to constitute a State primary road system, to be administered under the jurisdiction of the Commission. (The approval of the boards of supervisors for primary road improvement plans in their respective counties was required until the law was changed in 1927). The law also made provision for paving primary roads, and created a State primary road fund, composed of Iowa federal aid, automotive-vehicle license fees, and later of 5/9 the State gasoline tax receipts. In lieu of State road bonds, impossible because of constitutional restrictions, the primary road law provided for the issuance, by counties voting favorably, of county primary road bonds, backed by county credit, but to be paid, both the principal and interest, out of the primary road fund.

The primary road law of 1919 has been gradually developed and improved by successive Iowa Legislatures until now the State, through the Highway

Commission has complete jurisdiction over the State primary road system. In 1927, the former commission of three, one ex officio, was expanded to five, all appointive.

Federal Aid first came into the Iowa road picture in 1917, and has been of increasing value. By its aid, the State highways of Iowa have been coordinated with those of other states. In 1925 about 3,000 miles of Iowa primary roads, selected jointly with the U. S. Bureau of Public Roads, were set aside as U. S. Highways, part of the great national system. Since 1919, the improvement of the Iowa State Primary Road System has proceeded rapidly toward completion, as shown in Table 1036-C, herewith,

TABLE 1036-C  
IOWA PRIMARY ROADS IMPROVEMENT, NOVEMBER 30, 1919-1933

		:	:	:	Gravel:	Graded :	Not :
		:	:	:	or :	not :	Graded :
Nov. 30, :		Paved :	Bitum. :	Surface :	Stone :	Surfaced :	Miles : Total
Year :	Miles :	Miles :	Miles :	Miles :	Miles :	Miles :	Miles
1919 :	21.0 :			655.8:			6412.1
1920 :	66.8 :			792.3:	1021.4 :	4738.0:	6618.5
1921 :	236.0 :			1156.0:	1447.8 :	3775.6:	6615.4
1922 :	334.4 :			1558.0:	1761.1 :	2961.8:	6615.3
1923 :	419.1 :			1889.4:	2001.2 :	2337.9:	6647.6
1924 :	502.3 :			2164.4:	1934.4 :	2058.6:	6659.7
1925 :	568.6 :			2460.8:	1796.0 :	1848.7:	6674.1
1926 :	650.2 :			2819.4:	1732.3 :	1451.8:	6653.7
1927 :	939.7 :			3225.5:	1416.8 :	1083.4:	6665.4
1928 :	1624.5 :			3221.3:	1114.3 :	801.0:	6761.1
1929 :	2317.2 :			3136.6:	714.8 :	601.7:	6770.3
1930 :	3260.3 :			2693.4:	484.5 :	375.2:	6813.4
1931 :	3803.6 :			3069.8:	280.8 :	634.6:	7788.8
1932 :	4086.3 :	136.5		3067.2:	116.5 :	438.2:	7844.7
1933 :	4204.3 :	139.2		3082.7:	51.9 :	358.3:	7834.4

Note. For the expenditures on the above improvements during the years 1929 to 1933, see Table 1036-H

The annual maintenance of Iowa's State primary roads has been developed to a high state of efficiency since 1919. The roads are divided into maintenance sections, mostly 15 to 50 miles long, each provided with adequate snow removal and other maintenance equipment, properly housed; operated by permanently employed, skilled maintenance forces.

For the annual maintenance expenditures, 1929 to 1933, see Table 1036-H.

The improvement of Iowa's secondary roads has progressed simultaneously with that of her primary roads. Such improvement of the county trunk systems has been prosecuted actively ever since 1913.

The latest great advance in Iowa highway administration has resulted from the passage of a State Law in 1929 whereby jurisdiction over the 81,372 miles of township roads was taken away from the township officers and given to the counties.

In the counties in which the county supervisors have employed and supported a competent county engineer and put this work in his charge, more has been accomplished since 1929 in improving these former township roads than in the entire previous 90 years; while counties which have failed to follow this policy have accomplished little in comparison.

Data of the improvement of the county trunk and county local highway systems are shown in Table 1036-D, herewith,

For data of the expenditures on the construction and maintenance of county roads, see Table 1036-I.



TABLE 1036-D

## IOWA COUNTY TRUNK AND COUNTY LOCAL ROAD IMPROVEMENTS

January 1, 1927 to 1934

	County Trunk Roads					County Local Roads				
	: Gravel :	: not :	: Gravel :	: not :	: Gravel :	: Gravel :	: or :	: not :	: Gravel :	: Not :
:	: Stone :	: Sur- :	: Graded :	: Total :	: Paved :	: Stone :	: Sur- :	: Graded :	: Total :	:
:	: Miles :	: Miles :	: Miles :	: Miles :	: Miles :	: Miles :	: Miles :	: Miles :	: Miles :	: Miles :
1927 :	2.0 :	3223.4 :	717.8 :	7607.5 :	11550.7 :	:	2588.4 :	276.4 :	82045.0 :	84909.8 :
1928 :	6.0 :	3889.3 :	853.2 :	7083.2 :	11831.7 :	:	3474.0 :	377.7 :	80872.7 :	84724.4 :
1929 :	13.0 :	4911.2 :	748.8 :	6604.1 :	12277.1 :	:	5096.1 :	471.9 :	78677.7 :	84245.7 :
1930 :	16.6 :	5621.8 :	880.0 :	6352.7 :	12871.1 :	:	6560.4 :	707.3 :	75982.8 :	83250.5 :
1931 :	7.2 :	6205.6 :	981.9 :	5620.6 :	12815.3 :	:	7338.6 :	2213.7 :	72190.6 :	81743.5 :
1932 :	12.3 :	7075.9 :	1028.4 :	4718.6 :	12835.2 :	:	9556.7 :	2795.4 :	69497.4 :	81850.1 :
1933 :	16.3 :	7891.5 :	878.2 :	4197.3 :	12983.9 :	:	11506.5 :	2756.8 :	67379.5 :	81644.2 :
1934 :	16.9 :	8428.4 :	757.8 :	4008.3 :	13211.4 :	:	12215.5 :	2408.9 :	65745.9 :	81372.1 :
Total Secondary Road System, 94,583.5 Miles										

Historical Development of the Highways of Cerro Gordo County

The highways of Cerro Gordo County, Iowa, furnish a typical example of the historical development of the highways in one of those counties which have progressed farthest. It was in Cerro Gordo County that the first mile of rural highway paving in Iowa was located.

The highways of Cerro Gordo County are shown in Figure 1036-3, classified both as to systems and as to improvements, both of which numerical data are presented in Table 1036-E.

TABLE 1036-E

DATA OF THE HIGHWAYS OF CERRO GORDO COUNTY, IOWA  
As of January 1, 1935

<u>Highway System</u>				
	: :Paved :Miles	:Gravel :Surfaced : Miles	: Not :Surfaced : Miles	:Total :County : Miles
State Primary Roads	44.8	: 14.9	:	: 59.7
County Trunk Roads	: 4.7	: 116.0	:	: 120.7
County Local Roads	:	: 306.0	: 508.0	: 904.0
Total in County	: 49.5	: 526.9	: 508.0	: 1084.4

With minor exceptions, all the above roads were originally laid out when the county was first settled. There was little permanent road improvement before 1904. During 1904-1913, the Board of Supervisors built some good permanent culverts and bridges, mostly in voluntary cooperation with the then advisory Iowa State Highway Commission.

In 1913, a system of county highways, recommended by the Board of Supervisors, was designated by the State Highway Commission, and the work of draining, grading and gravelling it was begun actively by the supervisors, under the general direction of the Commission.

Also in 1913, the first mile of rural paving in Iowa was constructed, of concrete, on the east and west center line of Section 12, 96, 21, in Lake Township, on present U. S. Highway 18. Owing to scarcity of funds, the paving of U. S. 18 was not completed between Mason City and Clear Lake till 1918.

In 1919, the State Highway Commission designated the State primary road system, and the county voted promptly for a bond issue for paving. In 1920, 1921, U. S. Highway 65 was paved from Mason City to the south county line, and the paving on U. S. 18 was completed through the county. U. S. 65 was paved to the north county line in 1929. The supervisors continued the gravelling of the county trunk highways, which was completed in 1932.

In 1920, hostile public sentiment had forced the Board of Supervisors (whose approval of primary road paving projects was then required by law) to refuse consent to the paving of U. S. 65 near Rockwell unless it passed through that village. A number of persons were afterwards killed at the four right turns in the resulting detour forced upon the State Highway Commission. In 1931, this defect was remedied, without serious opposition, by constructing five miles of paving straight through,  $\frac{1}{2}$  mile west of Rockwell.

The paving on U. S. 18 between Mason City and Clear Lake was only 16 feet wide. The width of the other paving laid before 1932 was 18 feet. The traffic on U. S. 18 between Mason City and Clear Lake became so heavy that a paved relief primary road (Iowa 106), 20 feet wide, was constructed between those points in 1932.

The first mile of paving on U. S. 18, constructed in 1913, was not only narrow but rough, from the beginning, and was only  $6\frac{1}{2}$  inches thick. It became obsolete for these reasons, though not seriously disintegrated physically, and was reconstructed 20 feet wide and 12 inches thick in 1933, retaining the original  $6\frac{1}{2}$  inches as part of the new pavement.

Little was accomplished in surfacing the county local roads until they were turned over to the supervisors and the county engineer in 1929. Since that time, a large mileage has been graded and surfaced with gravel, as shown in detail on Figure 1036-3, and this work still is progressing rapidly.

The remarkable advancement in the improvement of the highways of Cerro Gordo County is shown strikingly in Table 1036-F herewith, prepared by County Engineer R. E. Robertson, giving data as of January 1, 1934.

#### Iowa Highway Traffic

The traffic on Iowa highways is very great; it has increased at an almost incredible rate between 1905 and 1930, but reliable data of its total volume and of its composition are woefully lacking. Adequate, state-wide, highway-traffic surveys are essential to obtain data for the studies which the Transportation Committee must make to reach sound conclusions concerning Iowa's best future coordinated transportation.

Data from adequate, reliable highway-traffic surveys are also essential to the State Highway Commission for use in organizing and directing highway maintenance, and to furnish a sound basis for planning future reconstructions, improvements and extensions.

#### Roughly Approximate Estimates of Total Iowa Highway Traffic

TABLE 1036-F

SUMMARY OF FARM HOMES AS TO LOCATION ON OR  
NEAR GRAVEL ROADS IN CERRO GORDO COUNTY

January 1, 1934

Township	Homes Not			Homes Within			Homes More			Total Number of Homes
	On, But			1 Mi. and More			Than 1 Mi.			
	Within $\frac{1}{2}$ Mi.			than $\frac{1}{2}$ Mile			From Gravel			
	No.	%	No.	%	No.	%	No.	%		
Grant	80	46	52	30	35	20	7	4	174	
Lincoln	81	59	27	20	18	13	11	8	137	
Lime Creek	127	78	23	14	13	8			163	
Falls	108	69	29	18	12	8	8	5	157	
Clear Lake	73	56	16	12	26	19	18	13	133	
Lake	81	59	17	13	26	19	12	9	136	
Mason	93	89	6	5	4	4	2	2	105	
Portland	99	83	11	9	7	6	3	2	120	
Union	48	46	17	16 $\frac{1}{2}$	22	21	17	16 $\frac{1}{2}$	104	
Mt. Vernon	67	60	20	18	14	12	11	10	112	
Bath	94	73	16	12	14	11	5	4	129	
Owen	88	75	17	14	9	7	4	3	118	
Grimes	75	58 $\frac{1}{2}$	32	25	17	13 $\frac{1}{2}$	4	3	128	
Pleasant Valley	99	81	22	17	1	1	1	1	123	
Geneseo	91	86	9	9	4	4	1	1	105	
Dougherty	85	77	15	13	9	8	2	2	111	
TOTAL	1,389	68%	329	16%	231	11%	106	5%	2,055	

CERRO GORDO COUNTY SECONDARY ROAD SYSTEM

Fig. 1036-3

Cerro Gordo County has one of the most advanced road systems in the state. A description of this system is included in this report as a sample of the possibilities.

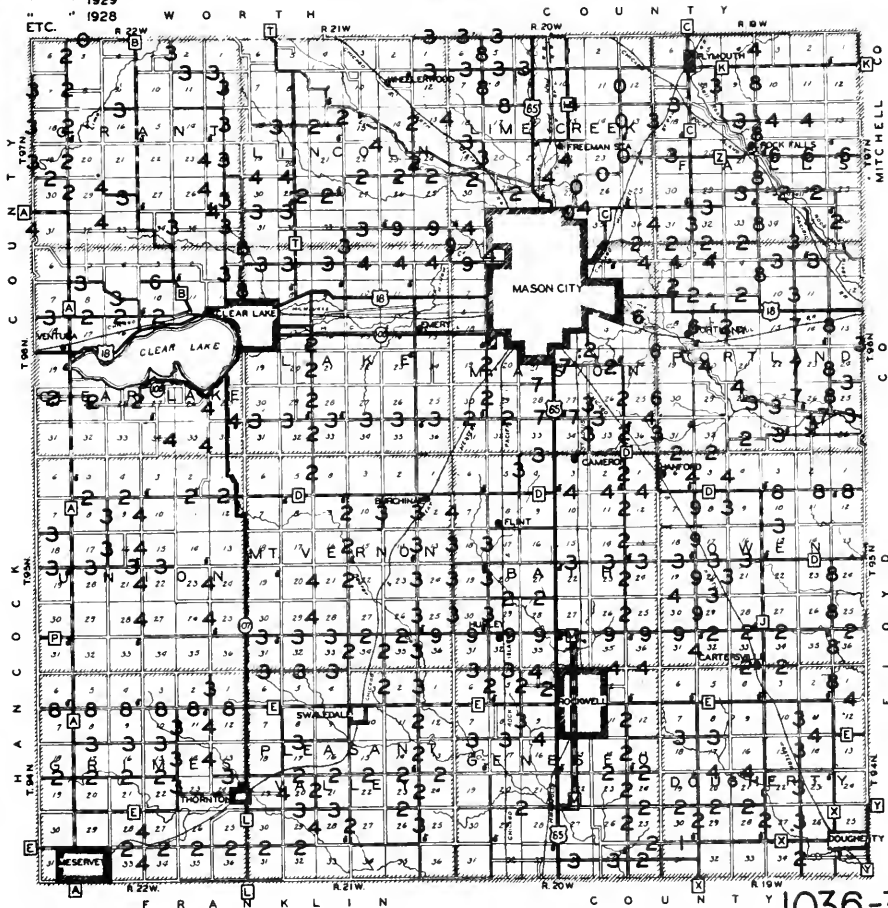
Many other counties are also well advanced in their planning and construction.

SHOWING GRAVEL PLACED ON  
LOCAL ROADS  
BY YEARS

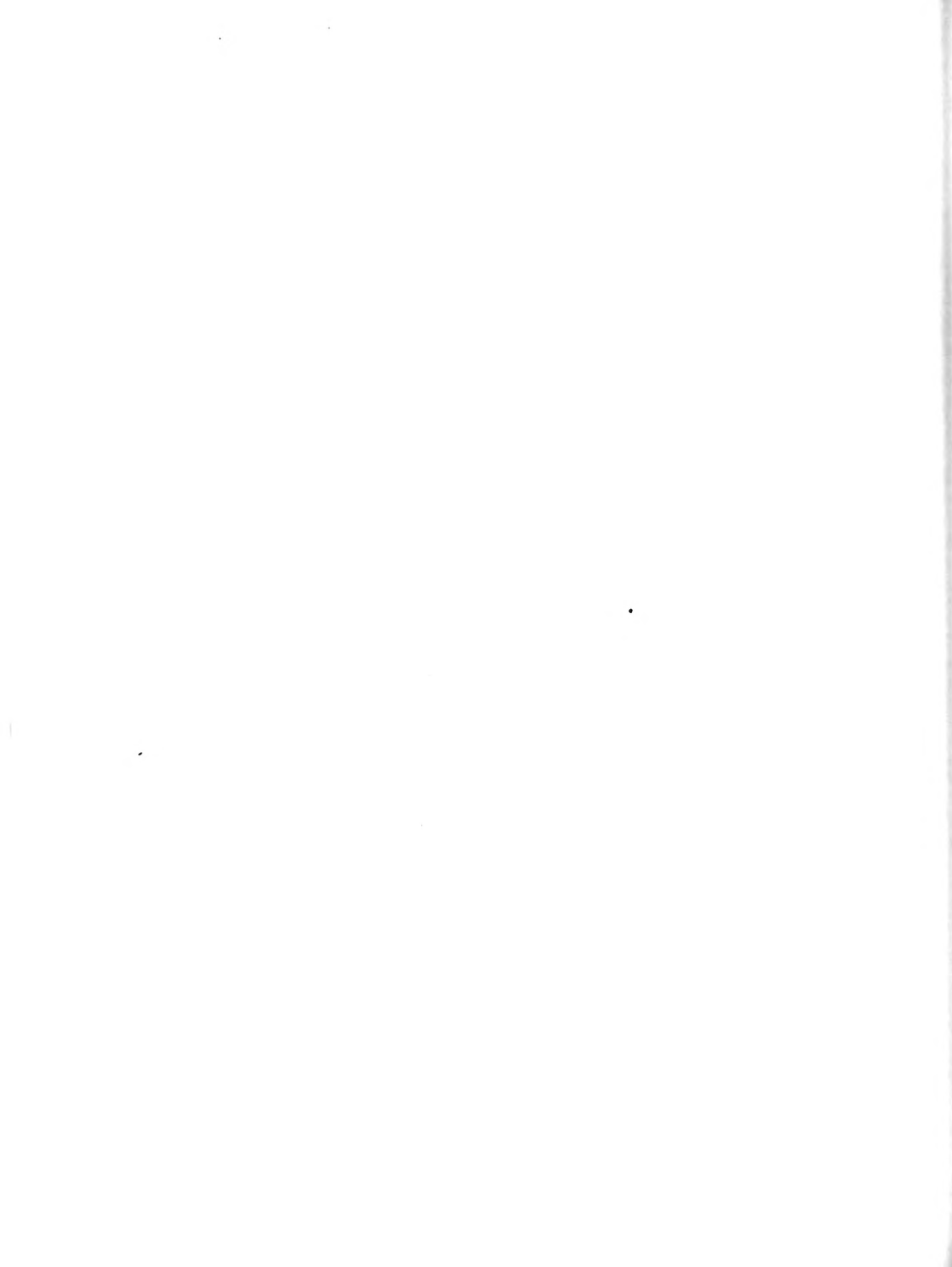
4- PLACED IN 1934  
3- " " 1933  
2- " " 1932  
1- " " 1931  
0- " " 1930  
9- " " 1929  
8- " " 1928  
ETC.

# MAP OF CERRO GORDO COUNTY IOWA

1934  
PRIMARY STATE ROADS PAVED  
COUNTY TRUNK SURFACED  
COUNTY LOCAL SURFACED  
COUNTY LOCAL DIRT



1036-3





In 1905, a road census of the animal drawn farm traffic over Iowa highways (then the bulk of the total highway traffic) was made a part of the regular State Census.

Unfortunately, the census funds proved to be insufficient to compile and publish the results. However, Mr. T. H. MacDonald, then engineer for the Iowa State Highway Commission, compiled the results for one typical township in each of the 99 counties in the state.\*

These incomplete 1905 road census data indicate that the animal-drawn farm traffic (which was then the bulk of the total) on Iowa's rural highways at that date approximated 35,000,000 ton-miles of heavy hauling for the year in wagon-loads averaging 2090 pounds net; and in addition about 255,000,000 vehicle-miles of farm light travel. Allowing 25% for other than farm travel, there may have been a total Iowa rural highway traffic in 1905 approximating 400,000,000 vehicle-miles.

-----  
\*First Annual Report, Iowa State Highway Commission, for the year ending July 1, 1905.

Immediately after 1905, Iowa highway traffic began to increase by leaps and bounds, owing to the rapid introduction of automobiles, and, after 1915, of motor trucks, as indicated by the registration figures in Table 1036-G herewith.

TABLE 1036-G

DATA OF THE REGISTRATIONS OF IOWA AUTOMOBILES AND TRUCKS

:Auto-: : : :Auto-: :				:Auto-: :			
Year	: biles	: Trucks	: Totals:	Year	: biles	: Trucks	: Totals
1900	: 75*	:	75:	1925	:615,171:	46,618:	661,789
1905	: 1,650*	:	1,650:	1930	:708,138:	73,417:	781,555
1910	:18,870 :	:	18,870:	1931	:671,714:	79,598:	751,312
1915	:145,382:	1,500*	:146,882:	1932	:608,023:	74,882:	682,905
1920	:410,894:	29,807	: 440,701:	1933	:562,802:	69,490:	632,292

\* Estimated. Note. The above figures do not include official cars and trucks, or trailers, or motorcycles.

The above data are supplied by Mr. Robley Winfrey, Bulletin Editor Iowa Engineering Experiment Station. In his Station Bulletin 114, Statistics of Motor Truck Operation in Iowa, Mr. Winfrey, on Page 26, concludes that the average annual mileage travelled by Iowa cars and trucks is about 8,000 miles for each. In his calculations, he assumed, in effect, that out of state vehicles travel as much in Iowa as Iowa vehicles travel outside of Iowa.

On the basis of the registration figures in Table 1036-G, and of Mr. Winfrey's calculations, automotive vehicle traffic over Iowa highway would be about 6,000,000,000 vehicle-miles in 1930; or 15 times the estimated approximate animal-drawn vehicle-miles in 1905.

Note that the traffic tonnage increased at a much faster rate than has the vehicle mileage. Passenger automobiles average more than four times the weight of horse drawn passenger vehicles; and the average weight of loaded trucks is now probably about double that of loaded farm wagons.

### Traffic Surveys

Besides the incomplete road census of 1905, already mentioned, only one highway traffic survey has been made in Iowa, that by Professor (now Dean) T. R. Agg, in 1919, for the Iowa Engineering Experiment Station.

This did not purport to even approximate a complete traffic survey. Its object was to obtain information about the character and composition of highway-traffic in Iowa roads, not its total volume. Nevertheless weighings of traffic were made on a number of different days at each of seven stations; and counts of traffic, 14 hours per day, for one week, were made at each of 107 stations, in 39 different scattered counties. The results were published in Bulletin 56, Traffic on Iowa Highways, Iowa Engineering Experiment Station, 1920.

No adequate reliable data of present Iowa highway traffic have been collected. They are so essential to the correct solution of Iowa's transportation problems that the Transportation Committee is already proceeding actively to start a much needed research on highway-traffic survey methods; and to arrange for the making of an actual comprehensive State wide Iowa Highway traffic survey, carefully planned in every detail.

The committee has arranged for the early start of what is hoped to be a 365 days, 24 hours per day master survey of the traffic on one of the heaviest traveled state roads, and as soon as practicable will prepare and submit to the Iowa State Highway Commission a definite project for an adequate State wide highway-traffic survey by the most approved methods.

### Motor Bus and Truck Traffic In Iowa

Since 1915, motor bus and truck traffic has grown to be of great

PASSENGER BUS LINES

Fig. 1036-4

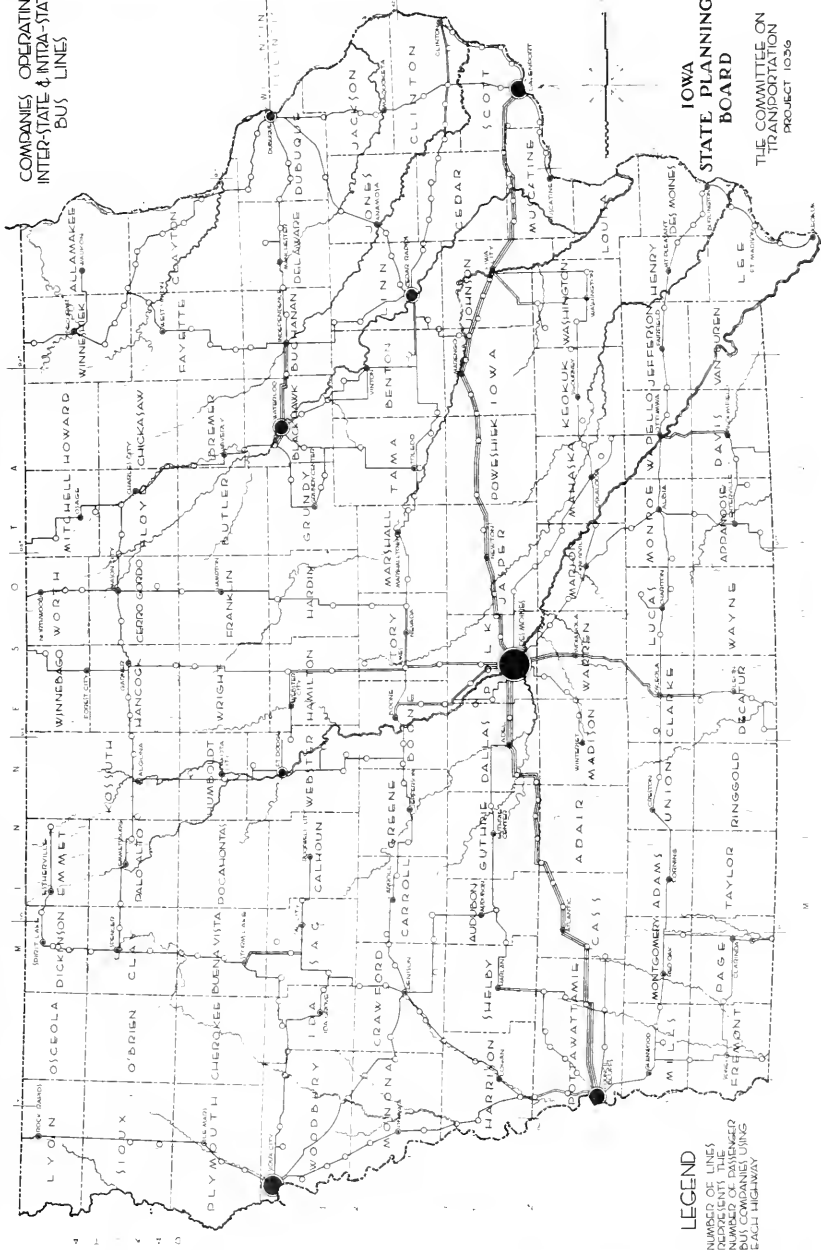
A comparison of this map and map 1036-1 shows that the passenger bus lines supplement the railways. The busses serve many communities which have no passenger trains, and they replace local trains on several of the main line railways. Some of the bus lines are operated by railway companies or subsidiaries.

# IOWA STATE PLAN

## PASSENGER BUS

## LINES

COMPANIES OPERATING  
INTER-STATE & INTRA-STATE  
BUS LINES



### LEGEND

NUMBER OF LINES  
DEPENDING ON THE  
NUMBER OF DISTRICTS  
SERVING  
CITY HIGHWAY

IOWA  
STATE PLANNING  
BOARD

THE COMMITTEE ON  
TRANSPORTATION  
PROJECT 1036

1036-4



importance on Iowa highways. Table 1036-G shows the rapid growth of truck registrations; and it should be further noted that the average weights of loaded trucks increased from 3720 pounds, in 1919, to 5843 pounds in 1931.

Figure 1036-4 shows the present bus-line routes over Iowa highways. Figure 1036-5 shows the present inter-state truck-line routes over Iowa highways. Figure 1036-6 shows the present intra-state truck-line routes over Iowa highways.

Note that Figures 1036-5 and 1036-6 fail to give any indication of the large volume of highway-traffic by privately owned trucks.

There is urgent need for comprehensive new legislation on motor bus and truck registration, regulation and taxation in Iowa. At present, the Secretary of State registers them; the Railroad Commission administers such imperfect regulation as the laws prescribe; the State Highway Commission plans, constructs and maintains the State highways over which they run (and 99 boards of supervisors the county trunk and local highways). Moreover, their license fees, gasoline taxes and ton-mile taxes have been fixed arbitrarily, by State laws passed without any collection or adequate study of data of the actual highway construction and maintenance costs which in equity they should pay.

The Transportation Committee plans much research and careful study of motor bus and truck traffic and the charges it should bear.

#### The Future of Iowa Highway Construction

The Transportation Committee is concerned especially with the future of Iowa highway traffic; and with the future highway systems which Iowa will need.

## INTERSTATE TRUCK LINES

Fig. 1036-5

This map shows only the regularly licensed interstate common carriers. Many trucks are operated by some of the lines. All sorts of freight is carried, some for long distances. These trucks furnish serious long-haul competition for the railroads.

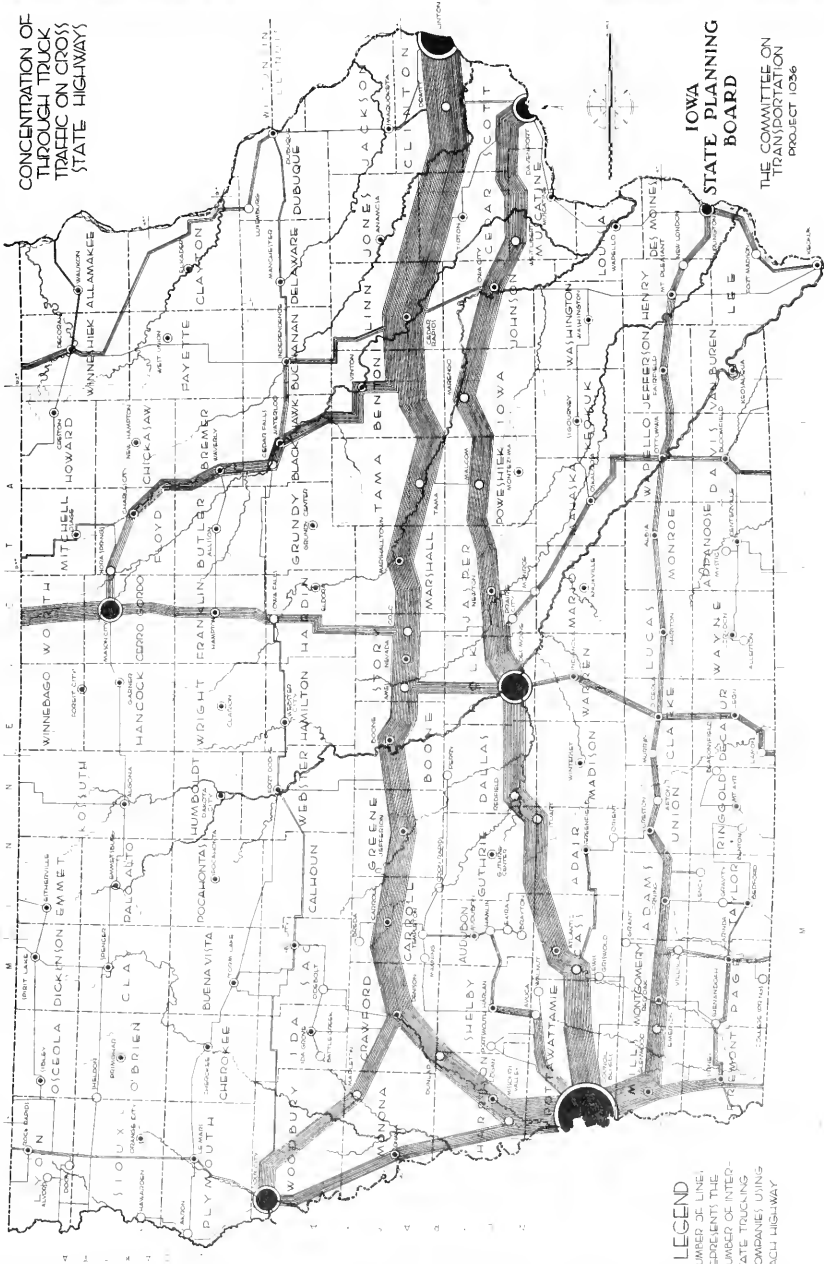
Note the large number of lines operating over U. S. Highways No. 30 and No. 6 between Council Bluffs on the west border and Clinton and Davenport on the east border respectively.



# IOWA STATE PLAN

# INTERSTATE TRUCK LINES

CONCENTRATION OF  
THROUGH TRUCK  
TRAFFIC ON CROSS  
STATE HIGHWAYS



## LEGEND

NUMBER OF LINE  
PERCENTAGE OF INTER-  
STATE TRUCKING  
COMPANY'S USING  
EACH HIGHWAY

IOWA  
STATE PLANNING  
BOARD

THE COMMITTEE ON  
TRANSPORTATION  
PROJECT 1036

1036-5



Evidently, highway traffic has decreased somewhat during the present business depression. It seems probable that any future increase of privately owned automobile traffic is likely to be at a much slower rate than during 1905 to 1930. On the other hand, it seems entirely possible that there may be a quite large increase in motor bus and motor truck traffic during the next 10 to 25 years.

#### Future Primary Road Construction

It is now considered that in the program for its work the Transportation Committee ought to include careful study of the following possible future primary road construction items. On January 1, 1934, the future construction items required to complete the present primary road system included the following:

Grading and Draining, 358 miles.

Paving, 3,632 miles of primary road remained unpaved; of which the Highway Commission feels obligated to pave the mileage proposed in the plans approved by the State in 1928. This will require about 750 miles. Decision to pave additional roads might well rest on the need shown by traffic surveys.

Other Surfacing. All primary roads not paved should be surfaced; probably by some low cost type of surfacing at least as good as bituminous treated gravel or stone.

The Transportation Committee feels that study should be made of the following possible extensions to the primary road system:

To towns, not now reached, of 150 or more population.

To State Parks and other recreation areas not now reached.

#### INTRA-STATE TRUCK LINES

Fig. 1036-6

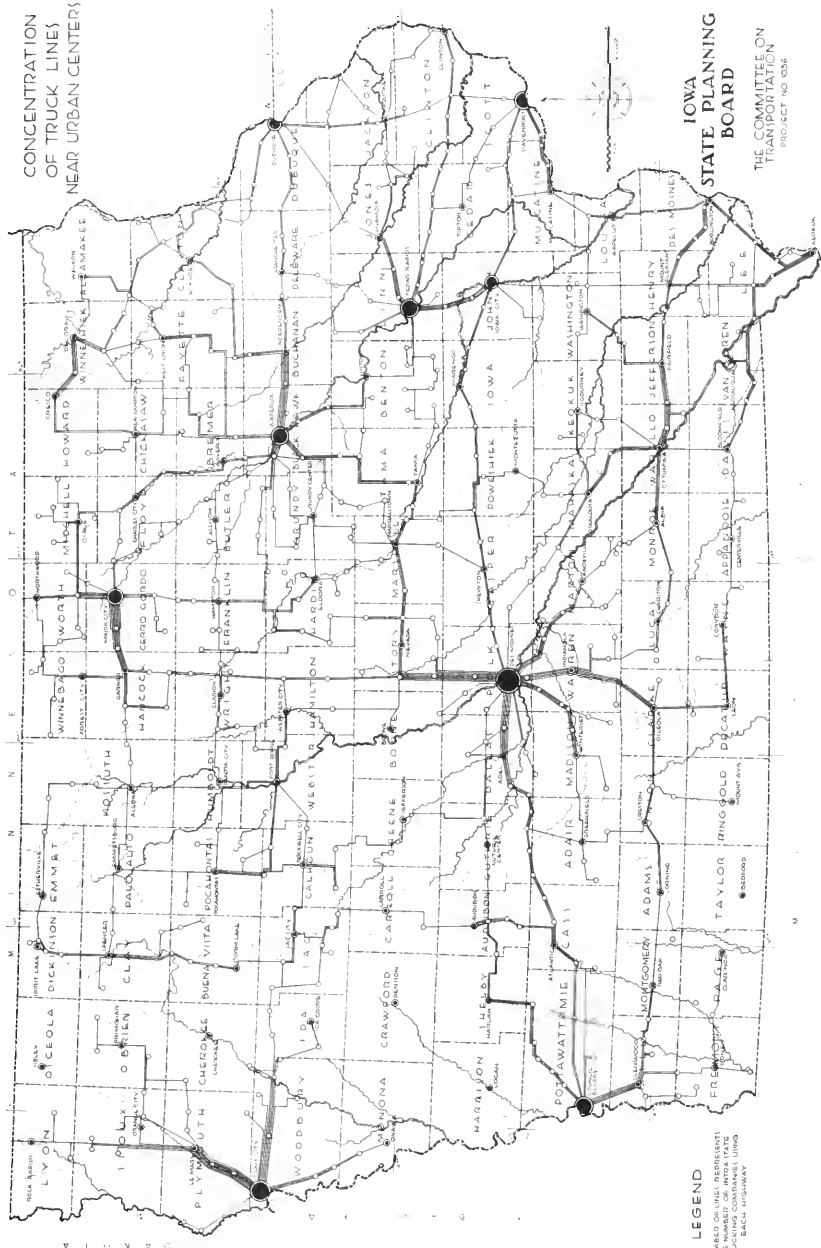
Concentration of licensed truck lines, operating wholly within the state, is largely around the principal cities. These trucks now carry a large portion of the less-than-carload freight and express formerly carried by the railways on local trains.

In addition to the truck lines which operate over established routes and on established schedules, there are a large number of trucks which are licensed by the Iowa Railway Commission to carry freight for hire. This is largely livestock and farm products. There are also many owner-operated or leased trucks in use by wholesalers and distributors.

# IOWA STATE PLAN

# INTRASTATE TRUCK LINES

CONCENTRATION  
OF TRUCK LINES  
NEAR URBAN CENTERS



IOWA  
STATE PLANNING  
BOARD  
THE COMMITTEE ON  
TRANSPORTATION  
PROJECT NO. 1036

1036-6

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Diagonal trunk routes, to shorten distances between principal centers of population.

Relief roads, including by-passes, where traffic becomes too heavy.

Missing links in the present system.

Possible improvements include:

Relocations, to improve alignments or grades.

Railway grade crossing eliminations.

Highway crossing improvements.

Improved signals and other safety devices.

Wider pavements (or other surfaces), and shoulders, where warranted, for new pavements and for reconstructions.

Highway beautification.

It is the purpose of the Transportation Committee to prepare a table showing the minimum and maximum probable reconstruction of existing highway surfaces and structures of all kinds to be expected each year for the next 10 years. The table is to be prepared after suitable field inspection by which existing surfacings and structures can be rated as to physical condition and probable future service conditions, and is to be based on the principles of mortality curves, constructed from data of the actual replacements of similar construction units.

#### Future County Road Construction

Studies by the Transportation Committee of future county road construction within the next 10 years are expected to cover the completion of the existing County Trunk Road System, including: grading and draining all mileage not yet so improved; surfacing all mileage not already so

improved by gravel, stone or better surfaces, and replacing part of the present surfacing by bituminous treated or otherwise better surfaces; the making of reasonable extensions of the county trunk road systems; the making of reasonable improvements of the county trunk road systems, and the making of a general study of the future reconstruction to be expected.

The Transportation Committee also expects to make a general study of the wise amount of future construction work on county local roads within the next 10 years, including: the per cent of local roads which should be so graded and drained and the possible cost.

Types of low cost surfacings; the per cents of local roads which should be surfaced with each type, and the probable cost; and the probable amounts of reconstructions for which provision must be made.

#### The Financing of Iowa Highways

The financing of Iowa highway construction and maintenance is one of the major problems of State and county welfare and policy. The sums required are so great as to constitute a heavy burden on tax payers and road users; and yet good roads are absolutely essential to public and private welfare - financial, physical, educational and even intellectual and spiritual.

The financial methods used in raising the great sums which already have been spent in constructing and maintaining Iowa's great highway system have been evolved gradually, as the result of experience with her resources and the restrictions of her constitution and institutions.

#### Expenditures on Iowa Highways 1919 to 1933

That the sums already expended on Iowa highway construction and



maintenance are very great is shown by the actual data exhibited in Tables 1036-H and 1036-I, below.

TABLE 1036-H  
EXPENDITURES ON IOWA PRIMARY ROADS  
1919 - 1933

To :	:	:	:
Nov. :	:	:	:
30 :	Construction:	Maintenance :	Total
1919 :\$	741,314:	* ** :	\$ 741,314*
1920 :	4,906,405:\$	614,297:	5,520,702*
:	:	:	:
1921 :	15,500,524:	2,264,693:	17,765,217
1922 :	13,324,555:	2,444,665:	15,769,220
1923 :	12,662,681:	2,420,900:	15,083,581
1924 :	10,479,315:	2,722,077:	13,201,392
1925 :	6,889,024:	3,021,004:	9,910,028
:	:	:	:
1926 :	8,402,786:	3,100,675:	11,503,461
1927 :	16,341,642:	3,743,210:	20,084,852
1928 :	29,946,607:	3,809,955:	33,756,562
1929 :	28,250,411:	4,621,702:	32,872,113
1930 :	42,616,687:	3,311,621:	45,928,308
:	:	:	:
1931 :	28,143,206:	3,361,930:	31,505,136
1932 :	14,337,094:	3,021,681:	17,358,775
1933 :	8,809,539:	2,668,974:	11,478,513
<hr/>			
TOTAL:\$	241,351,790:\$	41,127,384:	\$282,479,174

\*Maintained by counties to July 1, 1920. Record not available.

\*\*Maintenance for  $\frac{1}{2}$  year.

TABLE 1036-I

## EXPENDITURES ON IOWA COUNTY ROADS

1930 - 1935

To :	County Trunk Roads		County Local Roads			
Dec. :	Construction :	Maintenance :	Construction :	Maintenance :		
31 :	Total :	Total :	Total :	Total :		
1930 :	\$ 4,567,390 :	\$ 4,312,995 :	\$8,880,385 :	\$ 4,606,999 :	\$ 8,662,192 :	\$ 13,269,191
1931 :	4,159,487 :	3,244,601 :	7,404,088 :	4,689,085 :	8,053,421 :	12,742,506
1932 :	3,534,711 :	3,142,260 :	6,476,971 :	4,092,670 :	7,885,381 :	11,978,051
1933 :	1,643,002 :	2,006,120 :	3,649,122 :	2,647,262 :	5,512,116 :	8,159,378
TOTAL :	\$13,704,590 :	\$12,705,976 :	\$26,410,566 :	\$16,036,016 :	\$30,113,110 :	\$ 46,149,126

Prior to 1930, separate accounts of construction and maintenance expenditures are not available for either the county trunk roads or the county local roads (then the township roads); and the expenditures from the country bridge funds are not classified as between county trunk and township roads. The total expenditures on both the county trunk and the township roads 1919 to 1929, inclusive, were as follows:

Bridge work (both systems)	\$ 69,230,389
County trunk roads	60,878,436
Township roads	<u>76,332,909</u>
Total on county roads 1919-1929	\$206,441,734
Total on county roads 1930-1933	<u>72,559,692</u>
Total on county roads 1919-1933	\$279,001,426
Total on primary roads 1919-1933	<u>282,479,174</u>
Total on Iowa Highways 1919-1933	\$561,480,600

The above figures show that the large sum of more than \$560,000,000 has been spent since the World War in constructing and maintaining Iowa highways. Complete records of the division of county and township road expenditures between construction and maintenance prior to 1930 are not yet available to the committee, but it seems probable that perhaps in the neighborhood of \$375,000,000 may have been invested during 1919-1933 in the construction of county and of state primary roads.

#### The Correct Basic Principles of Highway Finance

The correct basic principles of highway finance are more easily understood when it is recognized that the State and the county highway systems are great public utilities, comparable to the railways, but owned and operated by the public.

The capital originally invested in a highway system by the public is the sum required for its construction. The public has obtained part of

this capital by the sale of bonds, and/or other evidences of indebtedness (e. g. anticipation certificates); part was obtained by direct taxation; part came from net return, the excess of regular income over maintenance plus depreciation; and part from the reinvestment of the depreciation reserve, that part of the earnings, (regular income) required to make good the annual losses from depreciation by reconstruction when road property must be retired.

The annual operation expenses of a highway system are its actual annual maintenance expenditures. The annual operation return from a highway system is the difference between its annual earnings and its annual operation expenses. The annual earnings of a highway system are the sums which it receives from fair permanent road taxes on property in return for road access, plus all road use charges, such as vehicle license fees, gasoline taxes, motor carrier ton-mile taxes.

The correct basic principles of highway finance require that the permanent property road taxes charged property owners for road access, and the fees and gasoline and other taxes charged road users shall all be fair, and be equitably proportioned between the payers, and that the total income therefrom shall be just sufficient to: pay all annual expenditures for maintenance; provide a depreciation reserve (best invested in highway replacements, improvements and extensions) sufficient to make good all losses from retirements of highway property units; and pay net return (in addition) equal at least to bond interest on the whole value of the investment in the highway property. These net returns are best invested in highway improvements and extensions.

### Iowa Road Bonds

In studying Iowa highway financing, it appears that only a comparatively limited fraction of the capital invested has been obtained by sales of bonds. Much the greater part of the vast expenditures required for construction has come from:

1. The proceeds of direct road taxes on property owners in excess of fair taxes for road access service.
2. The immediate reinvestment in the highways of those portions of the annual incomes which ultimately will be required to write off highway property retired. Such reinvestments constitute the depreciation reserve.
3. The investment of all net returns in highway improvements and extensions.

### Primary Road Bonds

Owing to constitutional restrictions, the attempts so far made to issue State primary road bonds in Iowa have been held unconstitutional by the State Supreme Court, even though approved at a State election. Consequently, although their principal and interest are paid entirely from the State primary road fund, all primary road bond issues have been dependent upon the vote of individual counties, first voting therefore, and are backed by county credit.

The 1933 report of the Iowa State Highway Commission shows that \$107,523,303.32 were obtained by sales of bonds, and \$106,892,359.38 expended for primary road construction between December 1, 1917 and November 30, 1933. The total primary road construction expenditures during this period were \$243,916,212.

On November 30, 1933, \$95,000,500 primary road bonds were still outstanding. These are all serial bonds, due after different terms of years up to 15.

#### County Road Bonds

The records of county road bonds at present available to the committee are too incomplete to permit any accurate estimate of the total amounts received from sales of county bonds and spent for road construction, including bridges.

In general, these county road (and bridge) bonds have been general county obligations, and interest and principal have been paid mainly from the proceeds of bond tax levies made for county bonds for all purposes.

The amount of county road (and bridge) bonds outstanding was \$19,589,291.16, January 1, 1928, and \$13,142,054.07, January 1, 1934.

#### Iowa Annual Road Revenues and Expenditures

Summaries for Iowa State and County Highway Systems for the five years, 1929-1933 are presented in Tables 1036-J, 1036-K, below.

Table 1036-J shows that the entire primary road operation return except that used for the payment of bond interest is being reinvested in the highways; partly in new construction (and/or reconstruction of retired property), and partly for retiring bonds. These reinvestments represent both the depreciation reserve and the improvement and extension of the property by investments of the net returns.

Table 1036-J shows that the annual payments necessary for bond redemption and interest increased from \$5,345,855 in 1929 to \$6,496,822 in 1933; and the estimate for 1934 is \$8,392,474. In accordance with a

TABLE 1036-J

## SUMMARY OF PRIMARY ROAD INCOME STATEMENTS, 1929-1933

	1933	1932	1931	1930	1929
<b>INCOME</b>					
Motor Vehicle License Fees	\$ 9,597,521:	\$10,517,370:	\$11,369,275:	\$11,521,269:	\$10,714,478
Gasoline Taxes	2,707,000:	4,394,000:	5,575,806:	5,136,000:	6,572,000
Highway Comm. Sup. Balance	88,780:	73,212:	73,631:	94,851:	68,881
Auto. Dept. Sup. Balance	40,327:	88,499:	247,827:	208,779:	171,447
Federal Aid	3,278,194:	2,889,509:	6,631,533:	3,875,822:	2,537,341
N.R.A.	549,381:				
Miscellaneous	6,174:	5,275:	9,397:	77,659:	54
<b>TOTAL INCOME</b>	\$16,267,377:	\$17,967,865:	\$23,907,269:	\$20,914,380:	\$20,084,201
<b>EXPENDITURES</b>					
OPERATION COSTS (MAINT.)	\$ 2,668,974:	\$ 3,021,681:	\$ 3,361,929:	\$ 3,311,620:	\$ 3,361,930
OPERATION RETURN	13,598,403:	14,946,184:	20,545,340:	17,602,760:	16,702,271
DISPOSITION OF OP. RET.	6,894,962:	10,980,710:	13,745,992:	15,726,385:	13,745,992
Invested in Construction	6,496,822:	6,149,736:	5,345,856:	3,788,755:	5,345,855
Bond Redemption and Interest	\$13,391,784:	\$17,080,446:	\$19,091,848:	\$19,515,140:	\$19,091,847
Balances, bonds etc.	+ 206,619:	- 2,134,262:	+ 1,453,492:	- 1,912,380:	- 2,389,576
	\$13,598,403:	\$14,946,184:	\$20,545,340:	\$17,602,760:	\$16,702,271

TABLE 1036-K

## SUMMARY OF COUNTY ROAD INCOME STATEMENTS 1930-1933

	1933	1932	1931	1930
<b>INCOME</b>				
Road taxes	\$ 8,986,996:	\$11,760,515:	\$15,705,316:	\$15,861,820
Special Assessments	92,465:	147,890:	121,864:	193,509
Poll Taxes	141,040:	285,821:		429,830
Gas Tax	3,607,134:	3,663,282:	4,505,081:	4,059,140
Motor Carrier Tax	232,911:	211,335:	191,734:	208,218
Primary Road Refunds	740,408:	774,730:	811,269:	898,912
Miscellaneous	636,282:	657,313:	1,147,815:	1,618,228
<b>TOTAL INCOME</b>	<b>\$14,437,216:</b>	<b>\$17,500,886:</b>	<b>\$22,483,579:</b>	<b>\$23,269,457</b>
<b>EXPENDITURES</b>				
OPERATION COSTS (MAINT.)	\$ 7,747,577:	\$11,163,793:	\$11,637,049:	\$12,539,354
OPERATION RETURN	6,689,639:	6,337,093:	10,846,550:	10,730,103
DISPOSITION OF OP. RET.				
Invested in Construction	4,147,540:	7,239,496:	8,599,675:	8,820,380
Bond Redemption and Interest	181,587:	169,518:	201,107:	86,067
Ant. Cert. Redemption and Interest	176,083:	207,076:	278,832:	244,028
	\$ 4,505,210:	\$ 7,616,090:	\$ 9,079,614:	\$ 9,150,475
<b>Balances, Bonds etc.</b>	<b>42,184,429:</b>	<b>- 1,278,997:</b>	<b>11,766,316:</b>	<b>1,572,828</b>
	\$ 6,689,639:	\$ 6,337,093:	\$10,846,550:	\$10,730,103



refunding law passed by the last legislature, it is estimated that about \$8,100,000 per year for bond redemption and interest will be required from 1935 to 1950.

Table 1036-K shows that more than two-thirds of the county road revenues are raised by taxes on property instead of by charges for road use. These taxes on property pay for the road access services rendered property owners, and in addition represent any capital collected by taxes for investment in road construction. This table also shows that the maintenance costs eat up a much larger part of county road than of primary road revenues.

#### The Place of Highways in Iowa's Future Transportation System

As in the case of the railways, the Transportation Committee plans to make careful impartial studies of the place of Iowa highways in Iowa's future coordinated transportation system. A number of the studies planned of future railways involve the future highways. In addition, many special researches and studies are required because of the comparatively recent development of great, improved Iowa highway systems carrying enormous traffic.

The various researches and studies required have already been mentioned in connection with the highway subjects discussed above. Some of them may be recapitulated to advantage, as follows:

An immediate 365 day 24 hours traffic survey on one main highway, financed mainly by relief funds.

An adequate State-wide, carefully planned traffic survey by the most approved methods, to be financed by the State Highway Commission and the

U. S. Bureau of Public Roads.

A national research involving the collection in several states of actual mortality data of different types of highway surfacings and structures. Financing already arranged.

A carefully prepared table of the limits of the probable future annual reconstructions of existing highway units during the next 10 years. Financing already arranged.

A study of the feasibility of a valuation of Iowa's highways, and of whether it would be justified.

Studies of the total annual costs of Iowa highways, including first construction costs, maintenance costs and reconstruction costs.

Studies of Iowa highway taxes and fees of all kinds, including the equitable amounts and apportionments, and special studies of bus and truck motor carrier fees and taxes.

Studies of Iowa highway financing methods, and of the economic limits of highway costs.

Studies of the proper coordination of Iowa highways with railways, waterways and airways.

Studies of possible future highway improvements, including: wider pavements; wider rights of way permitting better development of roadsides; more contact of abutting land use; better maintenance of roadsides; cheaper types of surfacing; diagonal roads; and the distant possibility of separate highways for different kinds of traffic.

#### IOWA WATERWAYS SYSTEM AND CONNECTIONS

This discussion of the Iowa waterways transportation question must be

considered not only preliminary but merely tentative.

The organization of the Subcommittee on Waterways is not complete, and it has not yet begun its work. So far as the Transportation Committee has yet studied the subject, the problem of waterways transportation for Iowa appears to be wholly one of how and to what extent to use advantageously the great inland waterways along her eastern and western borders, to whose improvement for use by modern transportation agencies the Federal Government already is definitely committed, and in which, in fact, it already is actively engaged.

The fight against waterways is usually directed against their construction, which in this case is already settled upon, and in which the nation already has made large investments which will be wasted if the waterways are not completed. So far as the construction of any intra-state waterways in Iowa is involved in the waterways problem, it may be said at once that their construction to modern waterways dimensions (to accommodate barges to navigate nine feet channels) appears to be entirely out of range of practicability.

The Mississippi River is being improved to nine feet minimum channel depths along the entire eastern boundary of Iowa, and as far north as Minneapolis. A project for improving the Missouri River to minimum six feet depths as far north as Sioux City is under way along much of the State's western boundary.

A Washington dispatch of August 23, 1934, reports allotments from P.W.A. funds of \$5,370,000 for immediate work on Iowa's half along her boundary of the Mississippi River project, and of \$7,500,000 for half of

the Missouri project from Sioux City to the Missouri State line. Actual work on the Mississippi project has been under way some years, and the letting of large contracts on the Missouri project is just announced. It seems probable that six feet Missouri River depth will prove to be insufficient.

The great modern inland waterways system to which these costly river improvement projects will give Iowa access is shown in Figure 1036-7 herewith. Barges for nine feet channels, carrying up to 2,000 tons each, and operating in "tows" carrying as much cargo as a large ocean freighter, can pass direct from Iowa's Mississippi River ports to Minneapolis, St. Paul, Chicago, St. Louis, Louisville, Cincinnati, Pittsburgh, Memphis and New Orleans and connect with Great Lakes Shipping at Chicago, penetrate up the Tennessee River to Knoxville, and connect with ocean going ships of all sizes at New Orleans, provided that sufficient freight uses the waterways to maintain regular barge lines, earning a fair profit.

The main waterways question for the Transportation Committee to study would appear to be: Will it pay Iowa Shippers to use the waterways shipping facilities? And if so, what kinds of freight and how much will it pay to ship by water?

#### Brief Historical Review of Iowa Waterways

Until 1860-1865, the Mississippi and the Missouri Rivers were great transportation arteries, traversed by multitudes of the typical river steamboats of the times, the larger of which were capable of carrying from 200 to several hundred tons of freight, besides their passengers. Before the railroads came, this freight was hauled to and from the river ports (some-

times for distances of 150 miles) in wagons, which at McGregor sometimes waited over night, in a line two miles long, for their turns to unload and reload.

The advent and improvement of the railways, with their greater speed and their ability to receive and deliver passengers and freight at innumerable places close to the actual ultimate points of origin and destination, gradually destroyed most of this river commerce, which reached its peak at about the time of the Civil War.

Although the bulk of the long distance passenger waterways traffic seems permanently lost, there has been a considerable survival, and of late years a considerable revival, of waterways transportation of those classes of freight for which speed is not a determining consideration. It is now carried almost entirely in permanent, fairly standardized barges, operated in "tows", pushed and guided by powerful tow boats, specially designed and built for the service. A single "tow" transports freight, either up or down the stream, equal to the combined cargoes of a whole fleet of 10 to 20, or even more, former river steamboats. It is claimed that the volume of river freight is now as great as at the peak of the old packet boat service.

It is essential to the success of these modernized waterways, already completed or under way, that reliable, regular service by well established barge lines be supplied. The successful operation of such lines will require fair joint rail-water rates between all river and inland towns served, and adequate, efficient modern terminal and transfer freight handling facilities at the principal river shipping points.

As to the waterways themselves, satisfactory waterways transportation for Iowa requires only the completion of the Mississippi and Missouri Rivers projects (of which the latter, however, cannot be considered satisfactory with the present proposed six feet depths), and the early reconstruction of the seven feet Hennepin Canal east from Rock Island to the Illinois River to nine feet barge canal dimensions to shorten distances to Chicago.

The only other waterways construction needed in Iowa would seem to be that of suitable terminal and transfer plants at the principal river cities. So far, these are being constructed by the cities themselves. Dubuque's terminal is said to have cost \$500,000.

It is said on good authority that the opening of the Panama Canal in 1915 deprived Iowa Canning Companies of the entire Pacific Coast canned sweet corn market, which they had largely supplied before that date. This was because the new water rates from Atlantic Coast canneries were only about one-half the rail rates which Iowa Cannery had to pay. Worse yet, under the new situation, Atlantic Coast cannery could ship to Pacific Coast points and thence by rail back long distances to the east at lower total rates than the direct rail rates from Iowa.

The Panama Canal was built at the expense of the entire country, including the middle west, but the opening of the Canal put an industrial handicap on Iowa and other mid-western states, which the canned corn experience illustrates.

The new waterways system brings all-water transportation routes to the very doors of a multitude of midwestern shipping points, and one important Iowa transportation question now is: Can the industrial handicap caused

by the Panama Canal be overcome by use of the great inland waterways system which the nation is now placing at Iowa's disposal?

Effects of Waterways on Rail Rates

It seems to be true that on many classes of freight adapted to waterways transportation the actual water rates charged are lower than corresponding rail rates, either per ton-mile or for the total distance.

The Transportation Committee is not now entering into the controversy as to whether higher water rates should be charged to make up for "public subsidies", which it is claimed are much greater, per transportation unit, though apparently not in total amount, for the construction and maintenance of the waterways, owned by the public, than have been given outright by the public to the railways, owned by private corporations.

So far as a future coordinated Iowa Transportation System is concerned, the Committee must endeavor to earnestly deal fairly with actual facts, as they now are, and as they reasonably can be forecasted as most likely to be in the future.

Dr. Harold G. Moulton\*, in discussing the effects of competition in fixing railway rates, has said that: "Historically, water competition was of the greatest significance."

It is undoubtedly true that many present anomalies in rail rates are due to original rates established to meet waterways competition which long since has disappeared. For example, certain rail rates to Kansas City are said still to be low because there once were regular steamboat lines from and to Pittsburgh.

For many years, Iowa manufacturers and business men have been fighting

INLAND WATERWAYS

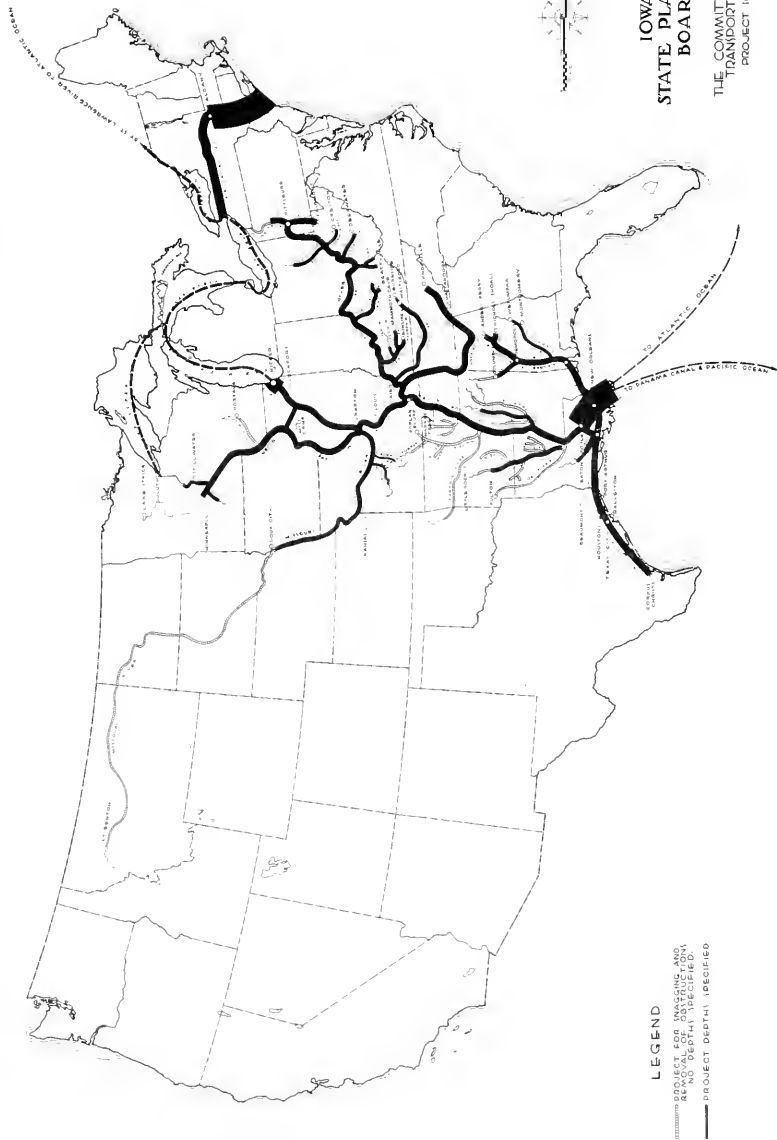
Fig. 1036-7

Iowa has access to the Mississippi and Missouri Rivers, which connect with other waterways as shown on this chart.



# IOWA STATE PLAN

# INLAND WATERWAYS SYSTEM



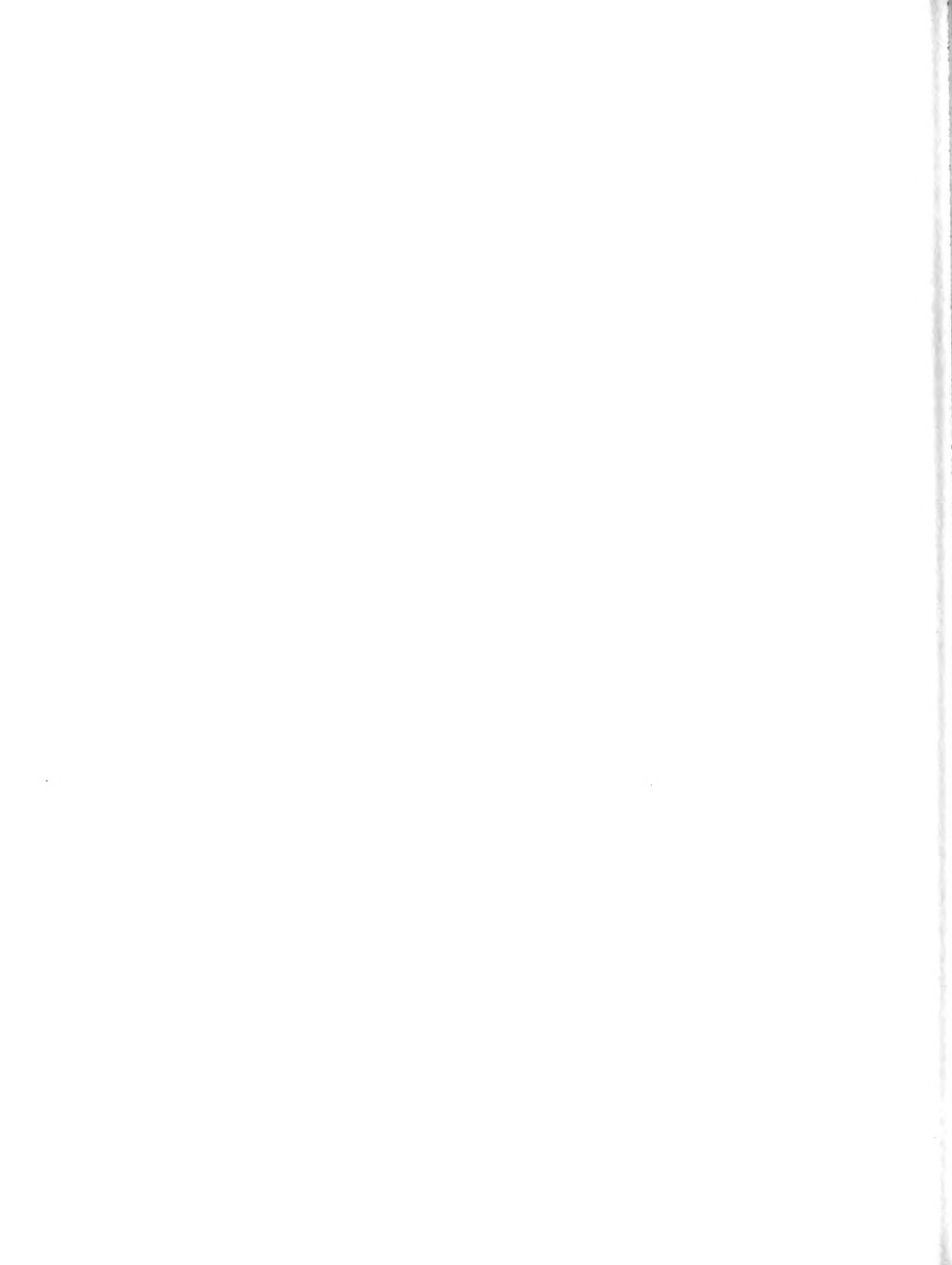
## LEGEND

----- PROJECT FOR IMAGINE AND  
REMOVAL OF OBSTACLES  
——— PROJECT DEPTH SPECIFIED  
——— PROJECT DEPTH SPECIFIED

IOWA  
STATE PLANNING  
BOARD

THE COMMITTEE ON  
TRANSPORTATION  
PROJECT 1036

1036-7



against railway rates which they claimed to be discriminatory against the development of Iowa Manufacturing Industries. So far as Pacific Coast Markets are concerned, a Waterloo Manufacturer, 1912, stated the Iowa position as follows: "When the time comes that the freight rates will be based upon the mileage, and freight from Iowa to the Pacific Coast is perceptibly less than from far eastern points to the Pacific Coast, factories in Iowa will have a better chance to get business."

This manufacturer was referring to the "----so-called blanket rate structure under which virtually all points east of the Rocky Mountains had the same rates to and from the Pacific Coast\*."

Another Iowa manufacturer said, \*\*also in 1912, that: "The freight rate on steel from Pittsburgh to Los Angeles is \$16 per ton, and the freight from Des Moines to Los Angeles is also \$16 per ton, or the same rate as from Pittsburgh. As we have to buy our steel in Pittsburgh, you can readily see that we could not pay \$6.70 per ton for shipping the material from Pittsburgh to Des Moines and then another \$16 per ton for shipping the material from Des Moines to Los Angeles."

Apparently, the "blanket rate structure", referred to above, originally was fixed in the absence of effective water rate competition between our Atlantic and our Pacific Coasts. Water rate competition with these blanket rates became effective for the Atlantic Coast by the opening of the Panama Canal, which the rest of the country helped pay for. A part of the Iowa waterways question now is: Would extensive use of the great new, modernized

\* The American Transportation Problem, Brookings Institute, Washington D.C., 1933, P. 128.

\*\*Bulletin 27, Iowa Engineering Experiment Station, 1912.

inland waterways system in the Mississippi Valley, partly paid for by Atlantic Coast regions, do for the mid-west what the Panama Canal did for the Atlantic Coast?

The transportation Committee plans to devote faithful study and give fair, unbiased consideration to all the waterways questions discussed, above, in this tentative preliminary report, and all other waterways questions, many no doubt, which arise as the committee's work goes on.

#### IOWA AIRWAYS

Air transportation, yet in its infancy, is already of great importance all over the world, and its future development is certain to be very great. It must have its full share in Iowa's future coordinated transportation system, and already the powerful beacons of great airways flash on Iowa's prairies.

Sections of the principal airways of the United States, in Iowa, are shown in figure 1036-9. Also shown on this maps are the existing Iowa airports.

#### Existing Airways Crossing or Touching Iowa

Three of the through airways in the United States either cross Iowa or touch the state on a border.

1. The San Francisco-Chicago Airway. The regular service on this airway is by the United Air Lines, Boeing Air Transport Company, Incorporated.

Professor William A. Devan of Iowa State College, has contributed the following data:

"This line crosses Iowa from Omaha, Nebr. to Moline, Ill. It has two

stopping points in Iowa; namely, Des Moines and Iowa City. It is one of the three great transcontinental air lines crossing the United States from west to east. During the year 1933, this line transported 35,286 passengers, 123,823 pounds of express and 1,109,525 pounds of mail, and flew a total of 28,405,142 miles. At present, this line is operating five trips a day each way between Chicago and Omaha, four trips a day each way between Omaha and Salt Lake City and three trips a day between Salt Lake City and San Francisco. Three regular stops are made at Des Moines and two at Iowa City. The time required to cross Iowa is about 2 hours and 15 minutes."

While operated by the United Air Lines, this airway is Federally lighted and equipped with radio beacons and provided with teletype and radio weather reports.

2. The Kansas City-Omaha-Sioux City-St. Paul Airway. This airway is operated by the Hanford Lines. Professor Bevan says:

"This line carries mail and passengers from Sioux City to St. Paul, and from Sioux City to Omaha. It carried 1,293 passengers in 1933. This line has recently received an air mail contract."

3. The Chicago-Kansas City Airway. This airway crosses the south-east corner of Iowa, but with no present Iowa Stops.

#### Possible Additional Through Iowa Airways

Figure 1036-9 shows two possible future additional through airways across Iowa. The Transportation Committee will study their probability and possibilities.

MIDWEST AIRWAYS

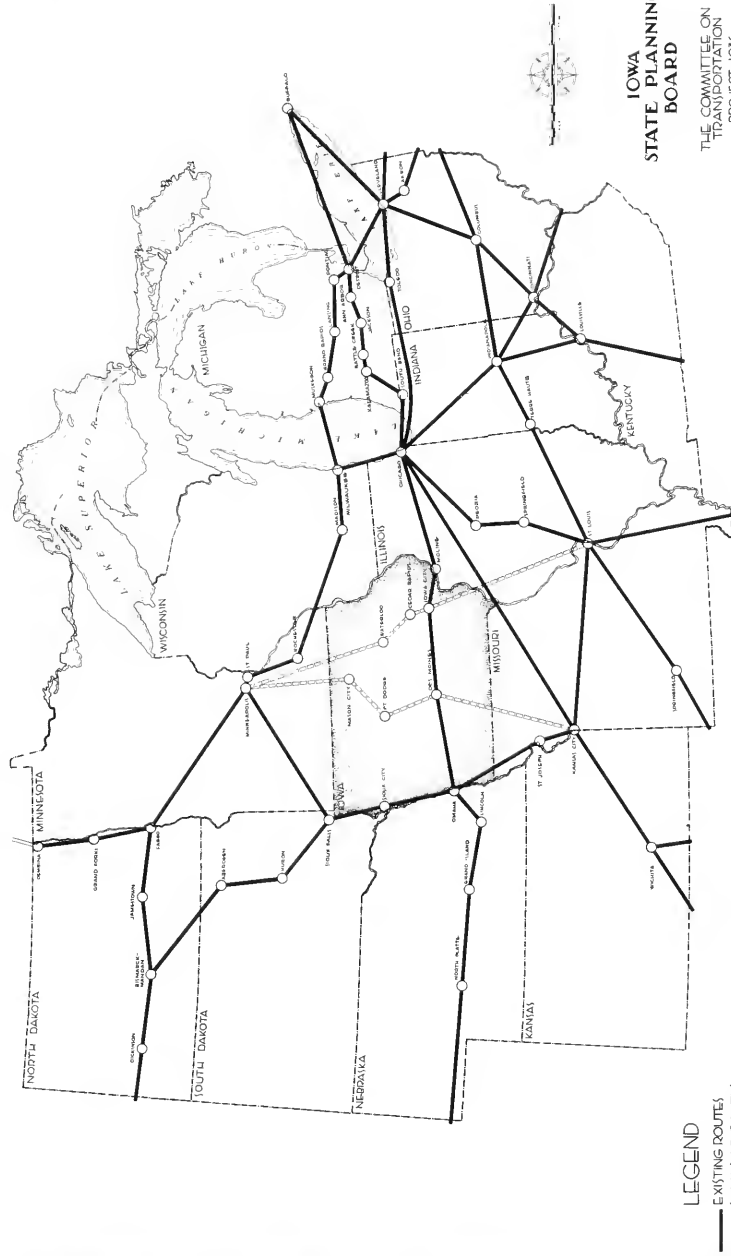
Fig. 1036-9

This chart shows the established airways  
with which those in Iowa connect.

# IOWA STATE PLAN

## MIDWESTERN

## AIRWAYS







4. A Possible New Airway from St. Louis to St. Paul with Iowa Stops at Burlington, Iowa City, Cedar Rapids and Waterloo.

5. A Possible New Airway from Kansas City to St. Paul with Iowa Stops at Des Moines, Ames or Boone, Fort Dodge and Mason City.

These north and south air lines would be used partly as feeder lines for the main transcontinental line from San Francisco to Chicago.

Fixed Base and Other Private Aeroplane Service in Iowa

1. Fixed Base Operators. "Some carrying of passengers is done by fixed base operators located at the municipal air ports or the larger private air ports. Some of these operators also teach flying."

2. Licensed Aeroplanes in Iowa. "On July 1, 1934, the Bureau of Air Commerce of the United States listed 114 licensed and 76 unlicensed aeroplanes in Iowa. Many of these unlicensed aeroplanes cannot or should not be flown. The Iowa Aeronautics Commission has recently taken steps to eliminate many of these unlicensed aeroplanes."

3. Licensed Air Pilots in Iowa. "There are in the State 170 licensed pilots of all grades. Iowa is one of the five states that has a less number of pilots than aeroplanes. This is probably due to the large number of unlicensed planes now in the states."

(The quotations are from Professor Bevan).

Existing and Projected Iowa Air Ports

The following list of Iowa air ports includes those municipal and private fields in existence in the state, together with a number of municipal ports that have been improved with C.W.A. labor, for which information as to the completeness is not available at present.

Municipal Air Ports

# Council Bluffs	" Cedar Rapids
" Des Moines	" Iowa City
Centerville	" Davenport
Ottumwa	Muscatine
# Waterloo	# Burlington
Dubuque	Dewitt

Forest City (CWA) completed

Private Air Ports

" Sioux City	Fort Dodge
Clarinda	Ames
Spirit Lake	Mason City

U.S. Intermediate Landing Fields

" Grinnell	" Atlantic
" Adair	" Oakland

Auxillary

Dennison	Algona
----------	--------

CWA Projects

Manchester	Columbus Junction
Sheldon	Belle Plaine
Holstein	Cherokee
Spencer	Hawarden
Shenandoah	Decorah

Pocahontas

# Always ground lights, flood lights by request.  
" Always lighted at night.

Development of Air Ports not on the Main Air Lines

With an improvement in the financial condition of the people of the United States and the development and manufacture of a small, safe aeroplane to sell at about \$1,000, there would be a great increase in the number of aeroplanes used for business and pleasure. These small aeroplanes could also be used as "taxi" planes to carry passengers and mail to main

line aeroplanes. The development and sale of such a plane as suggested above would also increase the use and the number of air ports in the state.

#### IOWA TRUNK PIPE LINES

Within the last few years an important new transportation agency has been constructed in Iowa, consisting principally of three main trunk pipe lines, extending entirely across the State.

One of these transports gasoline, and two natural gas. A number of stubs and branches from the natural gas lines have already been built to serve large and medium sized towns within reach, and permits have been issued for a considerable number more. In addition, there is a separate 24.6 miles line from Boone to Nevada for manufactured gas, and two main oil lines, from the Oklahoma Fields to Chicago, cross the extreme south-eastern corner of the State.

#### Description of the Iowa Trunk Pipe Line System

Figure 1036-10, herewith, shows a map of this Iowa trunk pipe line system. The three principal lines may be described as follows:

The Great Lakes Pipe Line Company, - Gasoline. The main line of this company from Barnsdall, Oklahoma, enters Iowa south of Lamoni and extends north, with double 8 inch lines, to Des Moines; and thence by single 6 inch lines to the Minnesota Line north of Northwood (and thence to St. Paul) and to the Mississippi River at Princeton (and thence to Chicago). It also has a branch from Osceola to Council Bluffs, 6 inches for 23 miles and thence 4 inches. Total pipe lines in Iowa, 586 miles.

The Natural Gas Pipe Line Company of America, - Natural Gas. The 24 inch main line of this company from Fritch, Texas, crosses the Missouri River near Pacific Junction, and extends a little north of east across Iowa to the Mississippi River not far south of Muscatine. There are branches to Cedar Rapids, Davenport and other towns. Total pipe lines in Iowa, 304 miles.

Additional permits have been granted for 289 miles of proposed branches to various cities and towns, including Waterloo, Ottumwa, Burlington, Ft. Madison and Keokuk.

The Northern Gas and Pipe Line Company, - Natural Gas. The main line of this company from Clifton, Kansas, to St. Paul crosses the Missouri river near Pacific Junction, and extends northeast, 24 inches, to Ogden; thence north 20 inches, to a point between Ft. Dodge and Webster City; and thence, northeasterly, 20 inches, to a 10 inch branch to Mason City; and thence a little east of north, 16 inches, to the Minnesota Line (and thence to St. Paul). There are 16 inch branches to Council Bluffs and to Des Moines, and an 8 inch to Ft. Dodge. Total pipe lines in Iowa, 442 miles.

The total trunk pipe line mileage in operation in Iowa August, 1934 was 1563 miles; 881 miles natural gas, with permits issued for 289 more; and 682 miles, gasoline.

#### Effects of Pipe Lines on Transportation

Trunk pipe lines, such as those constituting the Iowa system described above, affect the amounts of freight to be carried by other transportation agencies in two ways:

- 1st. They operate to decrease the amounts of gasoline, coal and other

fuels carried by other agencies.

2nd. By promoting the development of Iowa manufacturing and other industries, they may operate to increase both the amount and the value per unit of weight of manufactured and other industrial and commercial products.

Undoubtedly, the probable effects, the probable future extensions and the probable permanency of Iowa trunk pipe lines are worthy of careful attention and study.

A TEN YEAR PROGRAM FOR CONSTRUCTION ON  
THE TRANSPORTATION SYSTEM OF IOWA

The Transportation Committee has prepared a partial tentative outline of construction needed on Iowa's Transportation System during the years 1935 to 1944, inclusive. It is emphasized that this outline and the estimates are tentative only and are incomplete. They are subject to change and addition after further study.

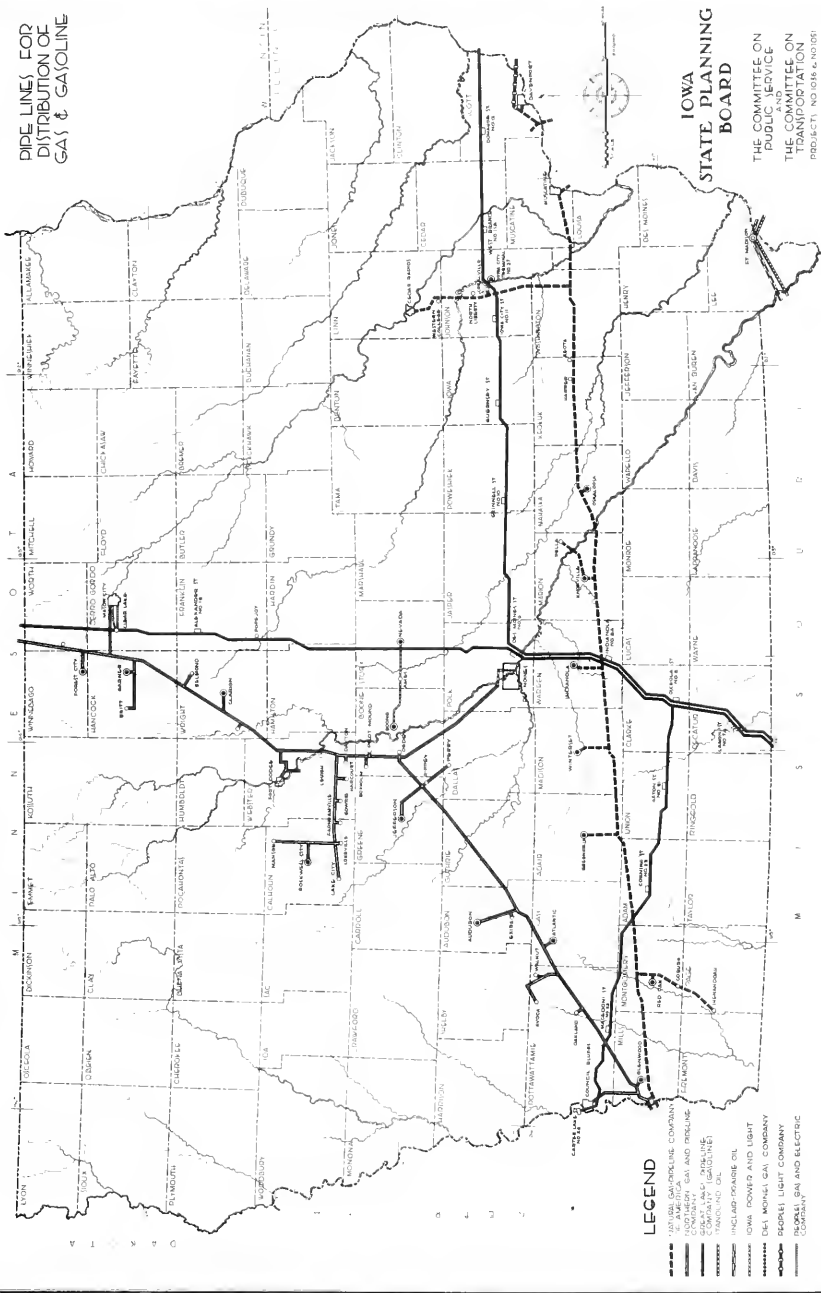
TRUNK PIPE LINES

Fig. 1036-10

These pipe lines carry crude oil, gasoline, natural gas and manufactured gas. They have nearly all been constructed in the past five years.

# PIPE LINES

# PIPE LINES FOR DISTRIBUTION OF GAS & GASOLINE

IOWA  
STATE PLANNING  
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THE COMMITTEE ON  
PUBLIC SERVICE  
AND  
THE COMMITTEE ON  
TRANSPORTATION

1036-10

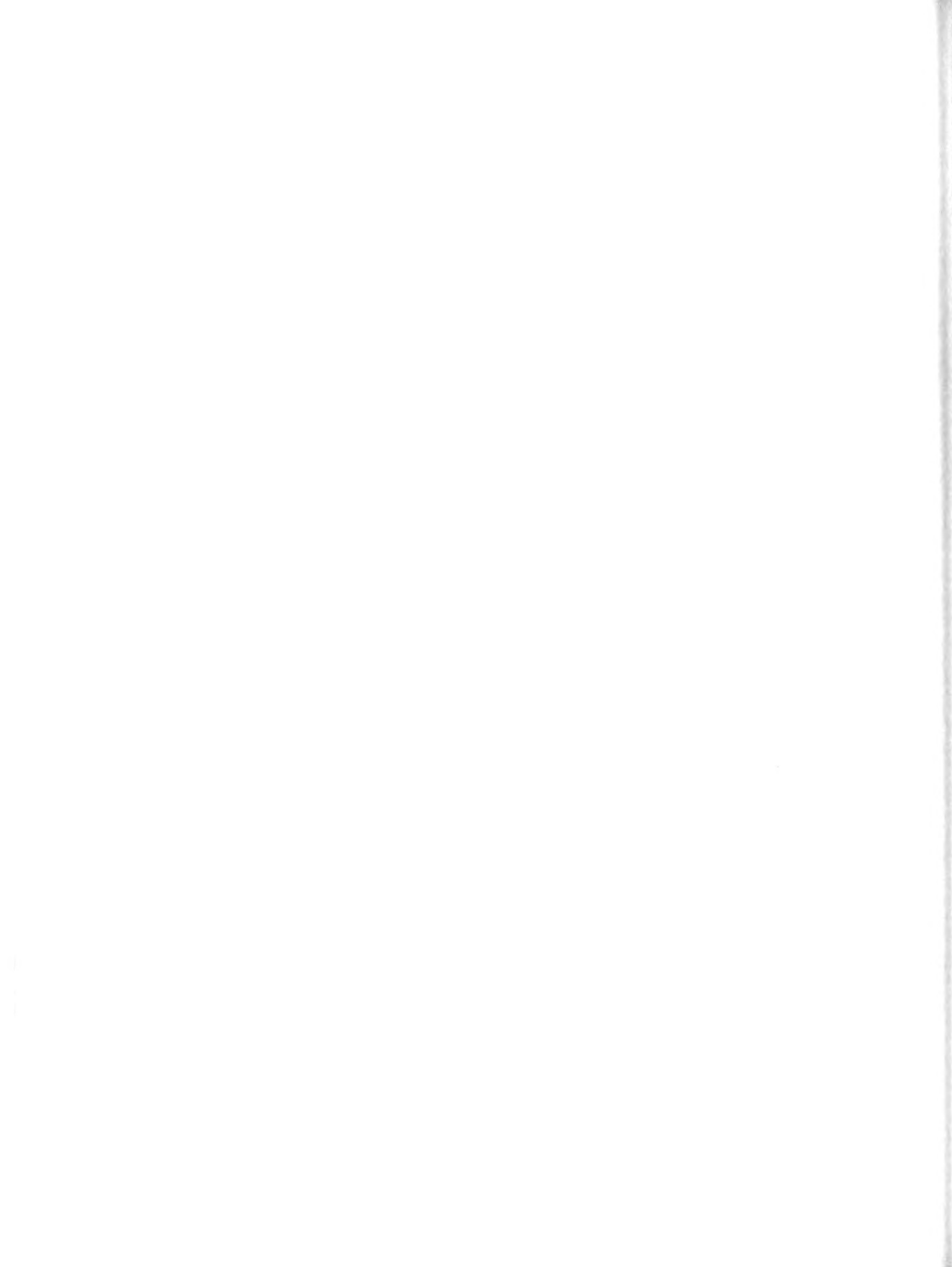




TABLE 1036-L  
ESTIMATED NEEDED CONSTRUCTION ON RAILWAYS  
1935 - 1944

Item	Estimated Cost	
	Public	Private
	Funds	Funds
Railway-Highway grade crossing elimination	:\$15,000,000.00	:\$10,000,000.00
Regular reconstruction	:	?
Reconstruction of main lines for higher speed trains	:	?
Improvement of freight and passenger handling facilities	:	?
Improvement and replacement of motive power and rolling stock	:	?
Beautification of railway property	:	?
Other Items	:	?

\* Also shown in highway construction tabulation.

TABLE 1036-M

ESTIMATED NEEDED CONSTRUCTION ON PRIMARY ROAD SYSTEM  
1935 - 1944

Item	Estimated : Cost	
	Public Funds	Private Funds
Completion of paving on bond issue system, with necessary regrading and drainage structures	\$22,500,000.00	
Grading, draining, and surfacing of ungraded portions of present system, 400 miles	4,000,000.00	
Grading, draining and surfacing of connections to towns of 150 population (not now served) and to newly developed State Parks	2,000,000.00	
Railroad crossing grade separa- tions on present system	*15,000,000.00	
Replacement of inadequate drain- age structures on present sys- tem	5,000,000.00	
Construction of additional trunk roads to shorten distance between principal cities	50,000,000.00	
Reconstruction of city routes or construction of by-pass routes for primary road traffic	20,000,000.00	
Resurfacing of existing gravelled roads, with dustless and more adequate surface - 2,400 miles	12,000,000.00	
Reconstruction of existing pavements	21,000,000.00	
Total estimated expenditure for justifiable construction on the Primary Road System during the period from 1934 to 1944, inclusive	\$151,500,000.00	

\* Also shown in railway construction tabulation.

TABLE 1036-N  
ESTIMATED NEEDED CONSTRUCTION ON SECONDARY HIGHWAYS  
1935 - 1944

Item	Estimated Cost	
	Public	Private
	Funds	Funds
Grading, draining and surfacing re- maining portion of County Trunk Roads	\$14,000,000.00	
Surfacing of part of County Trunk System with bituminous surface or equivalent	15,000,000.00	
Grading, draining and surfacing part of Local Road System	40,000,000.00	
Railroad Crossing improvement	5,000,000.00	
TOTAL	\$74,000,000.00	

TABLE 1036-0  
ESTIMATED NEEDED CONSTRUCTION ON WATERWAYS  
1935 - 1944

Item	Estimated Cost	
	Public	Private
	Funds	Funds
Completion of nine foot channel by Federal Government on eastern border of Iowa (one half of total) (\$5,370,000 recently allotted from PWA funds for immediate use)	?	
Improvement of terminal and transfer facilities on Mississippi River (by cities)	?	
Improvement of Missouri River channel by Federal Government on western border of Iowa. (\$7,500,000 recently allotted from PWA funds for immediate use)	?	
Improvement of terminal and transfer facilities on Missouri River (by cities)	?	

TABLE 1036-P

ESTIMATED NEEDED CONSTRUCTION ON AIRWAYS AND AIR PORTS

1935 - 1944

Item	Estimated Cost	
	Public	Private
	Funds	Funds
Improvement of existing airways	?	?
Improvement of air ports and air port facilities on existing airways	?	?
Construction of additional through airways and air ports thereon	?	?
Improvement of existing air ports not on through airways	?	?

TABLE 1036-Q

ESTIMATED NEEDED CONSTRUCTION ON PIPE LINES

1935 - 1944

Item	Estimated Cost	
	Public	Private
	Funds	Funds
Extension of Trunk Pipes Lines for Oil, Natural Gas, and Gasoline	—	?

INDUSTRY AND BUSINESS

Project 1040 - 1041

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COORDINATOR

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## STUDIES OF IOWA BUSINESS AND INDUSTRY

Population movements in the United States have been westward since the founding of the first colonies along the Atlantic seaboard and, where population has shown the way, industry has tended to follow.

One purpose of the committee on business and industry has been to trace the westward tendencies of industry and to discover, insofar as possible, just what Iowa may expect in the future with respect to new industries--whether it will be possible for her to attract and hold industries which will mean economic and social advantages for her people.

The studies for this preliminary report have been divided into the following parts: First, a series of general reports on Iowa business and industry which cover the state as a whole. Second, a preliminary summary of an industrial and business survey of Johnson County. It is hoped that this report will indicate the type of information that will be available through a survey of all the counties of the state. Third, a study of the opportunities for development of specific new industries within the state.

### Industrial Migration

The following comment on industrial migrations is based upon census data for the period 1914 to 1929. The data for 1931, where included, cannot be considered conclusive because of the divergent effects of the depression upon different types of industries.

The simplest method of determining the relative rates of industrial growth for the various sections of the United States is to trace the percentage of national manufacturing in each area over a period of years. Since 1914 it is apparent that the most rapid industrial growth has occurred in the

(1) East North Central, (2) South Atlantic, and (3) Pacific Coast groups of states. Other sections have generally failed to increase or have declined in national importance. The greatest decline in national importance has occurred in New England.

The West North Central group of states, including the state of Iowa, has shown little change in national importance in factory output since 1914. Iowa factories have contributed almost exactly one per cent of the national output each year of this period; in other words, Iowa industry has grown at about the national rate since 1914. During this period, however, industry has shown a definite westward migration, and a continuation of that movement might be expected to include portions of the states of Iowa, Missouri and Minnesota in the American Manufacturing Belt within the next 20 years.

This survey includes a detailed study of the migration of specific industries as well as data for individual states and cities, all of which will be presented in a later report of this committee.

#### Recent Changes in the Iowa Industrial Structure

Although the period 1914-1929 brought little change in the national importance of Iowa as a manufacturing state, certain internal changes in the location, rank, and national importance of specific industries are significant.

Iowa industrial development has been subject to marked decentralization. The leading manufacturing city, Des Moines, accounted for only 14.3 per cent of the state output in 1929. The remainder was produced in a number of small centers, well distributed over the area.



Examination of data for the period since 1909 shows no trend toward industrial concentration. One city, Waterloo, has grown rapidly in factory output but even when account is taken of this rise, no tendency toward either concentration or decentralization is indicated.

In terms of value added by manufacture, meat packing was still the leading Iowa industry in 1929. The washing machine industry declined to fourth rank, its value added by manufacture having decreased about \$5,000,000 from 1927 to 1929. In 1929, the data for the corn products industry were available (these figures were omitted in 1927). This industry ranked eighth in the state in this year. The canning and preserving industry advanced to a ranking of eleventh. Likewise, the clay products industry showed an increase in this period.

On the other hand, the gypsum industry (wall board, wall plaster, etc.) decreased more than 50 per cent in output between 1927 and 1929. In the latter year, the gypsum industry fell to a ranking of twenty-fifth among Iowa industries. In general, however, the major industries retained their state ranking. Important industries which reported substantially increased outputs included meat packing, newspapers and periodicals, foundry and machine-shop products, cement, and clay products. These gains in Iowa production, however, do not necessarily represent increases in the national importance of the state in these industries.

Based on value added by manufacture, Iowa industries using Iowa farm products as raw materials show some noteworthy changes. A slight increase in the Iowa percentage of national production for meat packing and packing house products occurred between 1927 and 1929; since 1909 the meat packing

industry of Iowa has been expanding. Scarcely any increase is recorded for the beef output of the Iowa plants, whereas the pork production increased from nine per cent in 1927 to 11.3 per cent of the national production in 1929. The poultry killing and dressing industry has shown a declining national significance. This state produced 17.8 per cent of the industry's output in 1929. No important upward or downward trends have appeared recently in such industries as butter, corn products or the other members of this group. In the production of butter, Iowa was exceeded only by Minnesota in 1929. While Iowa does not rank high in the general canning and preserving industry, it does possess a high standing in corn canning. In this industry Iowa ranked second to Illinois in 1929, processing this year 15.7 per cent of the country's supply of canned corn.

Farm Supply Industries.- For farm supply industries of Iowa, i.e., saddlery and harness, cloth gloves and mittens, agricultural implements, and dairymen's supplies, there are no important recent changes. The 1929 Iowa percentages of national production did not vary materially from the 1927 percentages. From 1909 to the present there have been no marked changes in this industrial group.

Local Industries, Group I.- The first group of local industries, i.e., manufactured ice, ice cream, confectionery, bakery products and manufactured gas, has shown no significant variations since 1909. The percentages in national production for this group of Iowa industries were nearly the same in 1929 as they were in 1927.

Local Industries, Group II.- Both the clay products and cement industries of Iowa increased slightly in national importance between 1927 and 1929. The remaining list of products in Iowa, except the concrete products industry which declined in national importance in 1929, showed no essential change between 1927 and 1929. Iowa's largest percentage of national output in the clay products industry was in drain tile and hollow building tile.

Local Industries, Groups III and IV.- Only slight changes appeared between 1927 and 1929 in the portion of national production of this group of Iowa industries. The divisions of the printing and publishing industry, the only important industry in this group, have shown no material changes since 1914. Foundries and railroad car shops have likewise shown little change in national importance.

Iowa Extractive Industries.- The cement and clay products industries are extractive, but they have been included with that group which serves the local market. The button industry of Iowa has grown gradually since 1914; in 1929 Iowa produced 19.8 per cent of the nation's buttons. It was noted previously that the volume of production in the Iowa gypsum industry declined more than 50 per cent between 1927 and 1929. In 1927, Iowa produced 9.1 per cent of the country's gypsum products; this relative standing had declined to 5.2 per cent in 1929. In 1929, however, Iowa was exceeded only by New York in the output of gypsum products. The Iowa gypsum industry processed in 1929, in portions of the national total, the following principal products: gypsum wall board, 11.9 per cent; fibered plaster, 10.6 per cent; unfibered plaster, 7.1 per cent.

Lumber Products and House Furnishings.- The portion of national production attributable to Iowa planing mills has decreased very little since 1914. The Iowa output of boxes has had no recent noteworthy changes. Basket products declined about 50 per cent in the amount of the nation's output between 1927 and 1929. A decline has been apparent in the output of ice refrigerators since 1925. Since 1914, the national significance of the Iowa broom industry has also declined. In 1929, Iowa manufactured 38.3 per cent of the nations washing machines and related appliances, and the state continued to hold a higher national ranking in this industry than in any other, despite a decline from a peak production of 49.5 per cent of the national output of these products in 1927.

Miscellaneous Industries.- The majority of these industries are small in this state and small in percentage of national production. Most of them have less than one per cent of the country's output. The industries having more than one per cent of the nation's production in 1929 are: stoves and furnaces, 2.2 per cent; miscellaneous tools, 1.9 per cent; coffee and spice roasting, 1.1 per cent; lime, 1.2 per cent. In Iowa the clothing, office supplies and advertising goods industries are not highly developed. In the case of clothing, the state market is served principally with the rough fabrications.

#### Manufacturing Trends in Iowa

Total and Major Groups.- As a preliminary to a detailed study of industrial growth in Iowa, an attempt is here made to depict the total industrial growth of the state since about the middle of the nineteenth century and to isolate the changing rates of growth in the major groups of industries. The

work is based upon a former computation of the Bureau of Business Research (College of Commerce, State University of Iowa) entitled "Industrial Growth of Iowa," by Miss Ruth L. Hoadley, edited by S. L. Miller, Director of the Bureau (May, 1928). More recent figures necessary in bringing the above mentioned study down to date have been obtained from the Federal Biennial Census of Manufactures of the United States.

The aggregate growth of Iowa manufactures is presented in Figure 1040-1. The data plotted in this figure represent the value added by manufacture by the various industries of the state in the years designated. Allowance has been made for changes in the general price level; that is, in the purchasing power of the dollar in general wholesale markets of the United States. The values as plotted are expressed in dollars of purchasing power as of 1910 to 1914. Thus, the effect of general fluctuations upon the purchasing power of the dollar has been removed, but specific changes in value in the aggregate of industry and in its various groups has been allowed to stand.

The average course of industrial growth has been mathematically estimated over the entire period (1850-1931) and is expressed by the smooth line. It is noteworthy that this line is of the same general type as that expressing industrial growth for the country as a whole, and indeed, for population and for many other series of statistical data. The fact that aggregate growth conforms rather closely to this curve strongly suggests the probability that the great variability noted later in several of the sub-groups is an evidence of shifting and displacing rather than of influence affecting aggregate change. For example, when an industry such as lumber declines as a re-

## INDUSTRIAL GROWTH IN IOWA

Fig. 1040-1

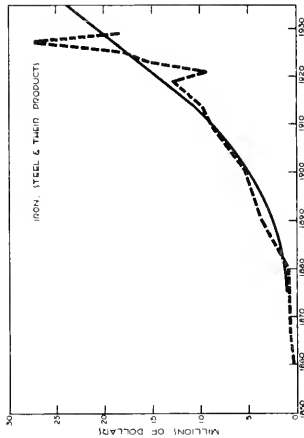
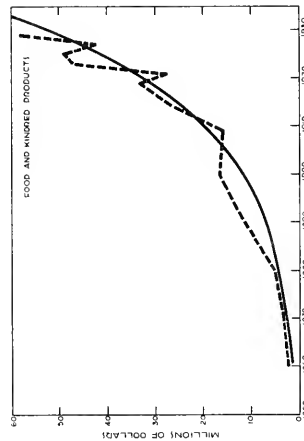
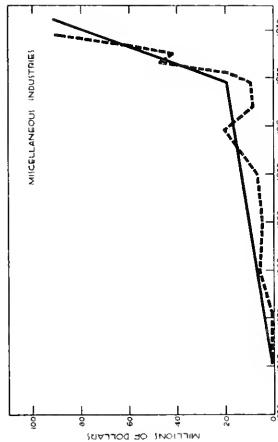
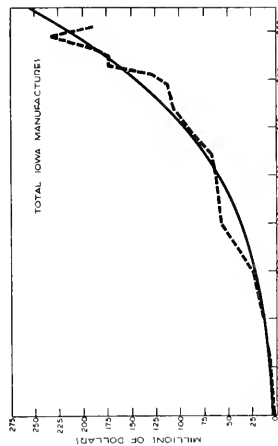
Fig. 1040-2

Fig. 1040-3

The data plotted in the graph portraying Total Industrial Growth represents the value added by manufacturers of the various industries of the state in the years designated. The values as plotted are expressed in dollars of purchasing power as of 1910 to 1914.

The average course of industrial growth has been mathematically estimated over the entire period (1850-1931) and is expressed by the smooth line.

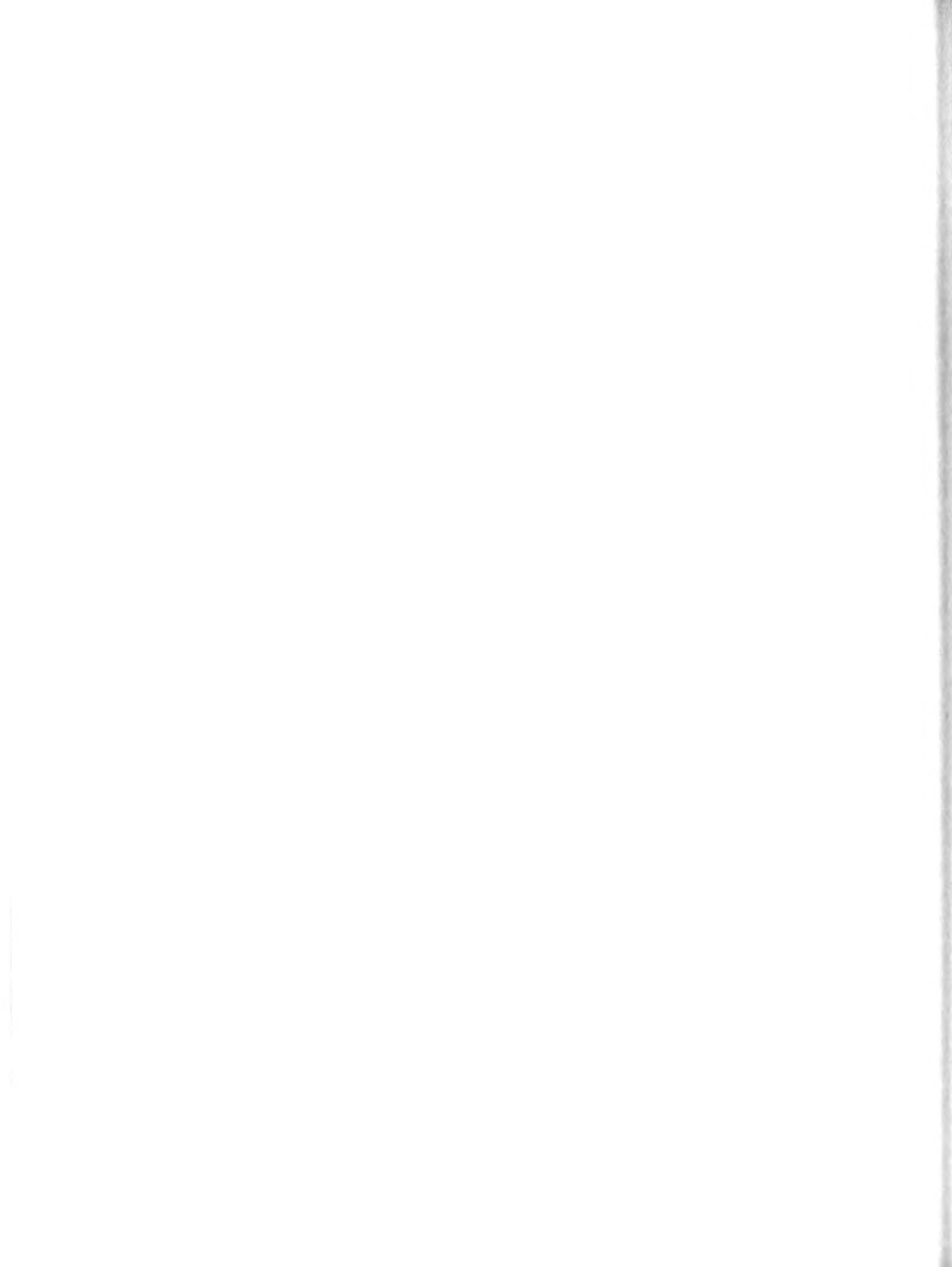
The other graphs in the following figures portray the same thing for each type of industry.



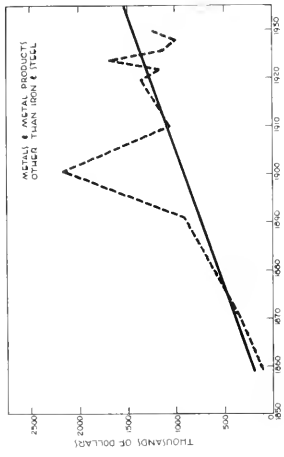
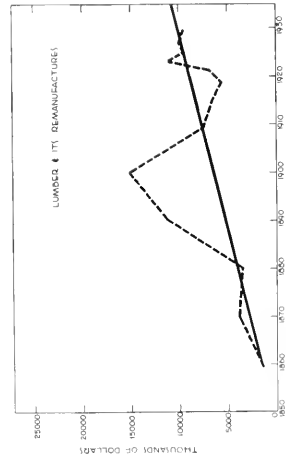
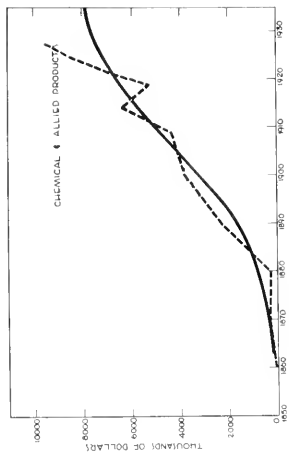
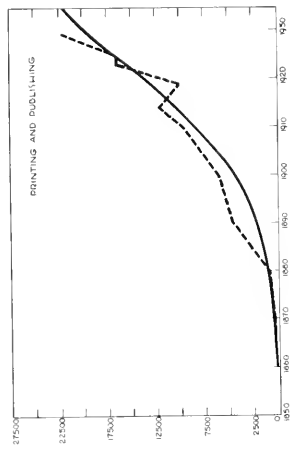
# IOWA STATE PLANNING BOARD MANUFACTURING TRENDS IN IOWA

LEGEND  
12 MONTH MOVING AVERAGE —  
TREND CURVE - -

PREPARED BY  
THE COMMITTEE ON  
INDUSTRY SURVEY  
PROJECT  
1040  
1040-1



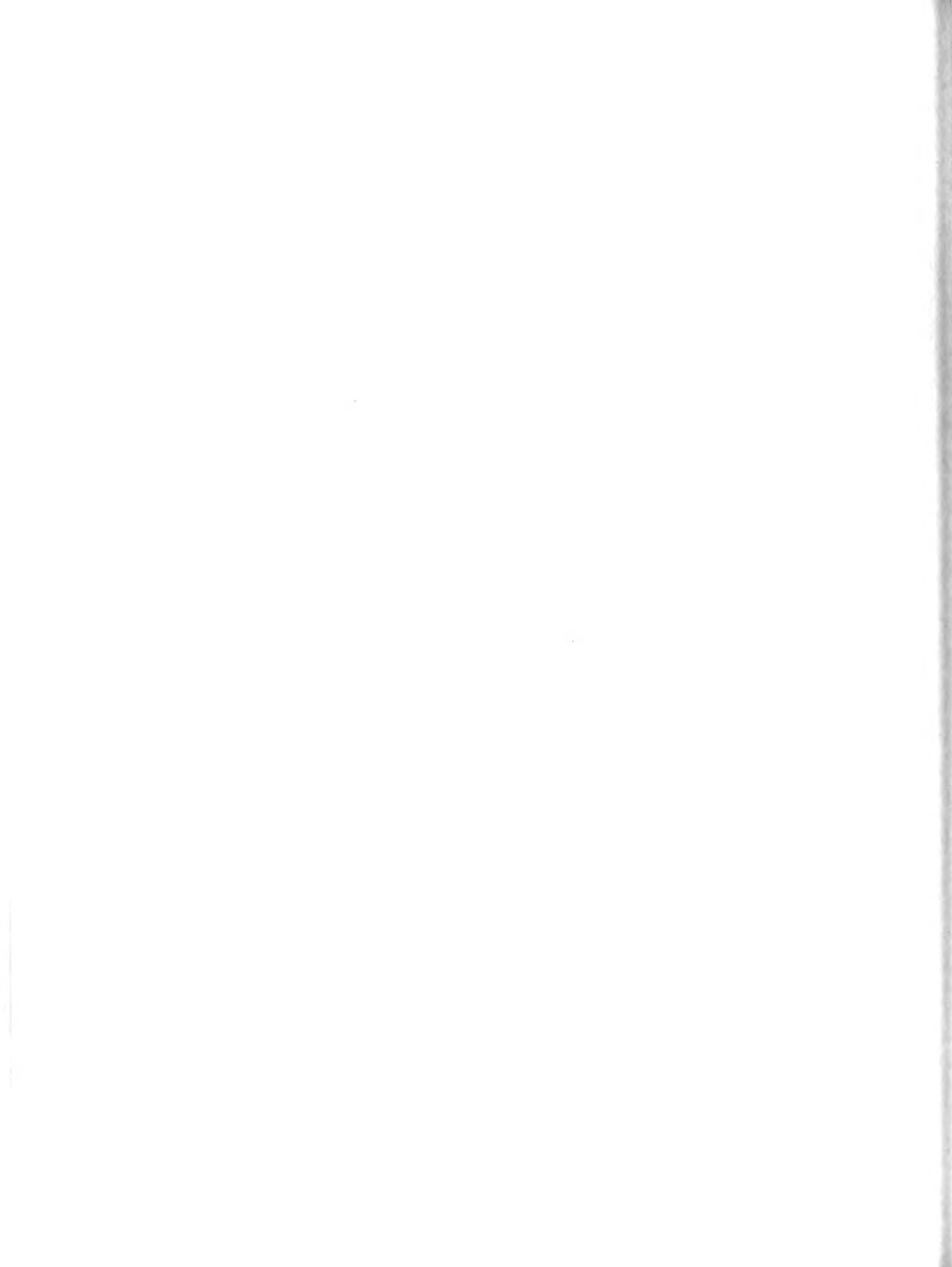


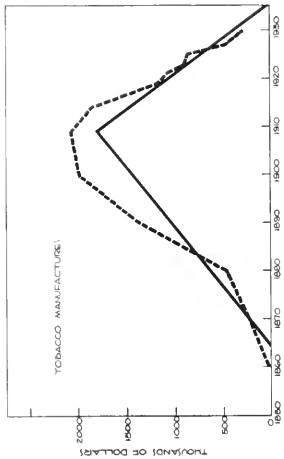
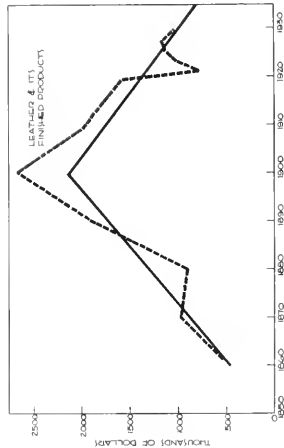
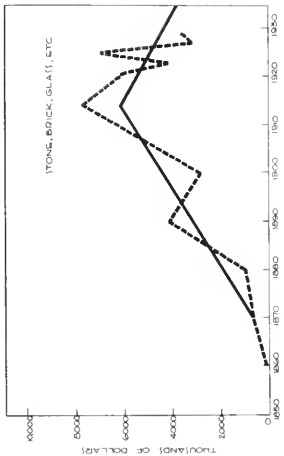
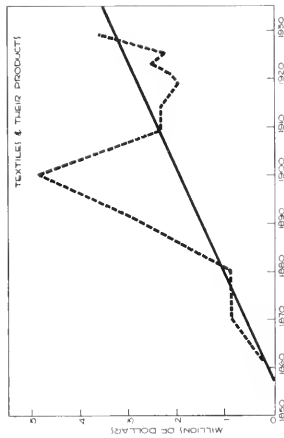


# IOWA STATE PLANNING BOARD MANUFACTURING TRENDS IN IOWA

LEGEND  
12 MONTH MOVING AVERAGE ---  
TREND CURVE —

PREPARED BY  
THE COMMITTEE ON  
INDUSTRY SURVEY  
PROJECT  
1040



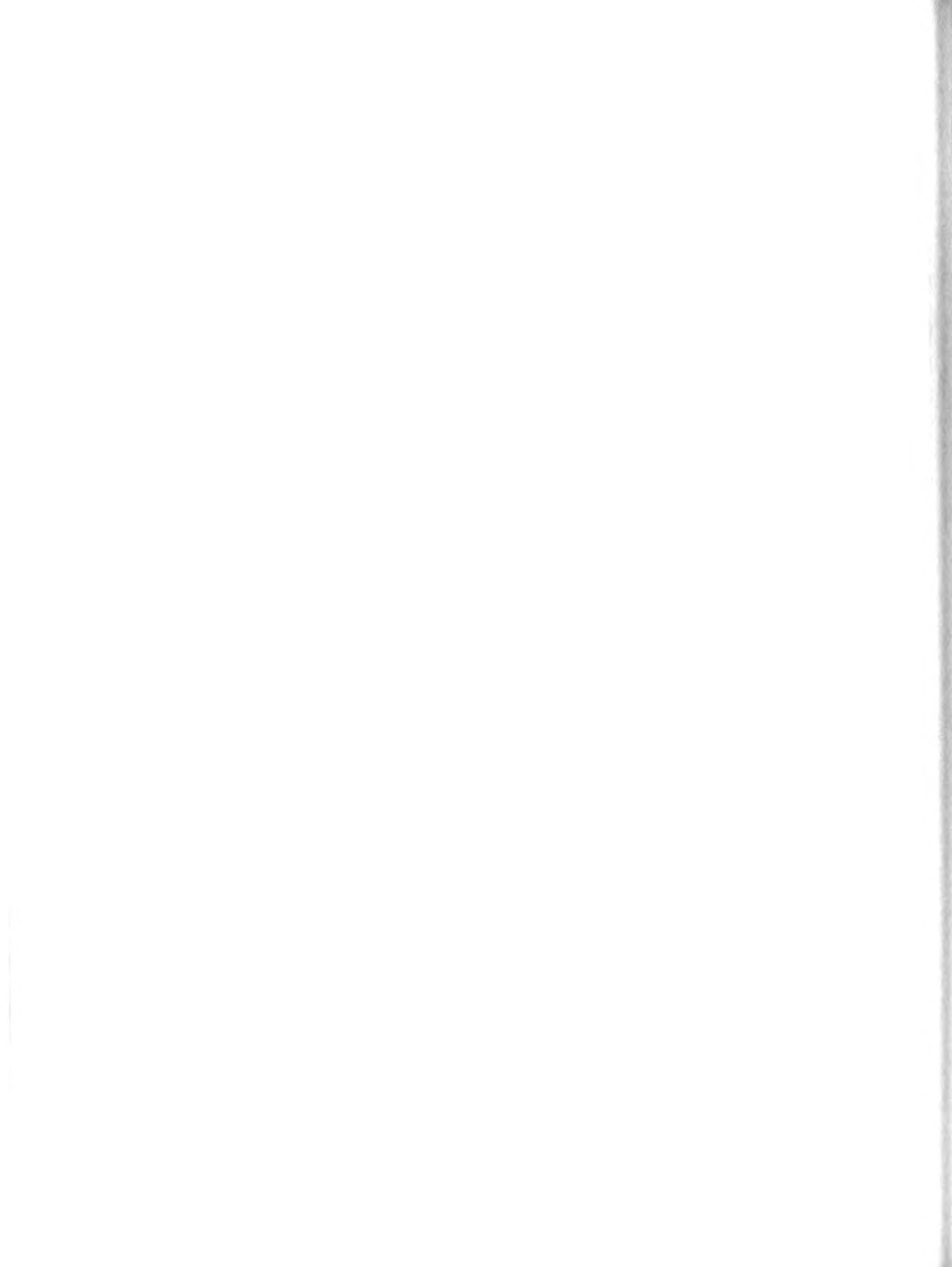


LEGEND

12 MONTH MOVING AVERAGE ---  
TREND CURVE —

# IOWA STATE PLANNING BOARD MANUFACTURING TRENDS IN IOWA

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THE COMMITTEE ON  
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PROJECT  
1040-3



sult of conditions inherent in natural resources, other lines of manufacturing, as, for example, printing and publishing, food manufacture, and iron and steel works, tend to attract the capital released from the declining industries. The average percentage deviation of the data from the trend is approximately 10.2 per cent.

As part of a preliminary survey of the major groups of Iowa industries, Figures 1040-1, 2 and 3 have been prepared depicting the course of industrial growth in each industry. In several of these groups the growth was constant enough so that it could be expressed on the average by the same type of curve used for aggregate growth. The groups thus treated as indicating fairly regular development are as follows: food and kindred products, iron, steel and their products, printing and publishing, chemicals and allied products, railroad repair and construction shops. The following industries showed fairly rapid growth up to about 1900 and on the whole a decline since that date: lumber and its re-manufactures, textiles and their products (a minor increase since 1925), leather and its finished products, and metals and metal products, tobacco manufacturers, and vehicles for land transportation. Two other groups, namely, stone, brick, glass, etc., and liquors and beverages, indicated major declines setting in about 1914, although the latter began a minor recovery in 1919.

The reason for the significant declines in certain groups and the shift of emphasis to other lines at the beginning of the present century is difficult to determine, but it is perhaps related to the increasing corporate organization and centralization of industry in the country as a whole which

has become strongly evident about that time. It may also be noted that these declines are not entirely offset by other increases but appear in a retardation of the aggregate growth which is evident from the years 1900 to 1923.

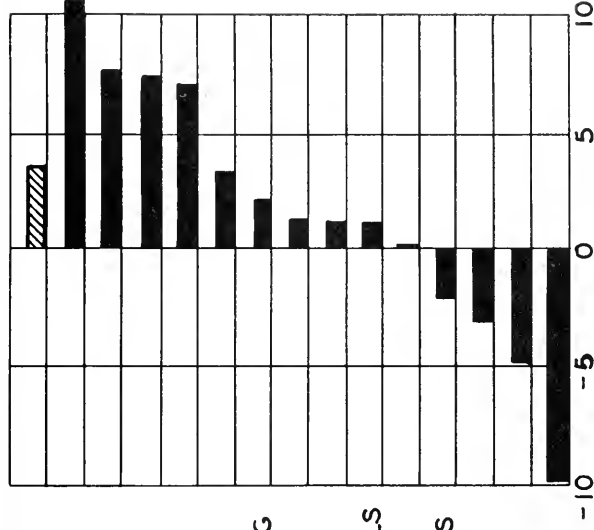
As a measure of the direction of growth or decline in the various groups of manufactures during the decade prior to the depression, the percentage change in the trend or average rate as of 1925 has been computed. In interpreting these figures, it should, of course, be recognized that they represent only rates of change as determined by the average course of growth over a considerable period of time and could not be taken unqualifiedly to represent the probable direction of growth which might have been expected if the depression had not interrupted. To arrive at such conclusions would require more detailed study such as will be made later. Nevertheless, these rates of growth or decline are of some significance as a preliminary measure and are summarized in Figure 1040-A. In studying this chart, comparison, of course, should be made of the more detailed chart preceding.

It will be seen from this chart that the rate of growth of manufacturing in the aggregate was about 3.85 per cent per year during the post-war decade. This rate compares rather closely with the rate of material business progress of about 3.75 per cent (figured from Burns, Production Trends in the United States).

For purposes of comparison, the various groups of industries may be classified according to their rates of growth or decline during the post-war decade and to the following four groups:

3.85% TOTAL

10.7	MISCELLANEOUS
7.74	FOOD PRODUCTS
7.2	RAILROAD SHOPS
6.94	BEVERAGES
3.76	IRON & STEEL
3.5	PRINTING & PUBLISHING
2.11	CHEMICALS
1.3	LUMBER
1.29	NON FERROUS METALS
0.15	TEXTILES
2.04	STONE BRICK & GLASS
3.18	LEATHER
4.86	VEHICLES
9.9	TOBACCO



IOWA MANUFACTURES,  
PERCENT CHANGE IN VALUE  
ADDED FOR 1925  
1910-1914 DOLLARS

1040-A





1. Rapid Growth,-

Miscellaneous Industries, Figure 1040-1:

Washing machines,

Wall plaster, wall board and floor composition,

Buttons, etc.

Food and kindred products, Figure 1040-1;

Railroad construction and repair shops (not charted);

Liquors and beverages (not charted);

2. Moderate Growth,-

Iron, steel and their products, Figure 1040-1;

Printing and publishing, Figure 1040-2;

Chemicals and allied products, Figure 1040-2;

Lumber and its re-manufactures, Figure 1040-2;

Metals and metal products other than iron and steel, Figure 1040-2;

Textiles, Figure 1040-3.

3. Moderate Decline,-

Stone, brick, glass, etc., Figure 1040-3;

Leather and its finished products, Figure 1040-3;

Land vehicles (not charted).

4. Rapid Decline,-

Tobacco manufactures, Figure 1040-3.

A Study of Cigarette and Gasoline Tax Returns in Iowa

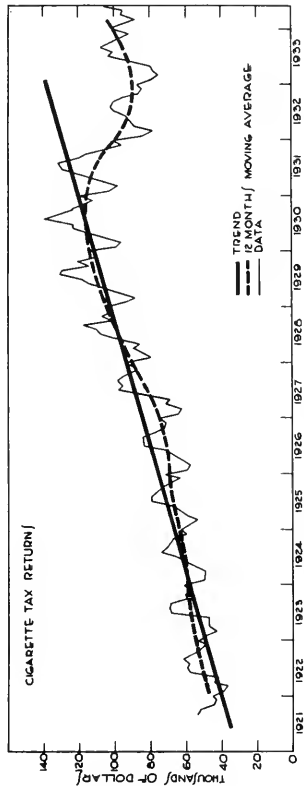
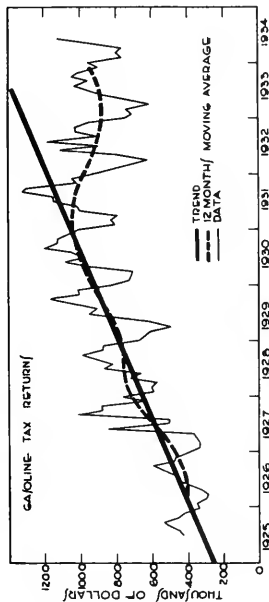
As a preliminary to a study of the new sales tax returns when they become available, a study has here been made of the returns from cigarette and

CIGARETTE AND GASOLINE TAX RETURNS

Fig. 1040-4

A measure of the business cycle of these two items is presented in the opposite figure. This represents deviations in the volume of business from the normal. By the normal is meant, in this case, the straight line trend modified by seasonal fluctuations.

This study was made as a preliminary to the experiment which will be carried out later with the sales tax returns when they become available.



# IOWA STATE PLANNING BOARD

## GAZOLINE & CIGARETTE TAX RETURNS

PREPARED BY  
THE COMMITTEE ON  
INDUSTRY SURVEY  
PROJECT  
1040

1040-4



gasoline taxes which have been in effect for a number of years. The general procedure was to isolate as far as possible the seasonal fluctuations, the general business cycles and the trend, by methods which are described below.

For those who are interested in the seasonal fluctuations, Table 1040-4 and its associated curve (see Figure 1040-B) show the average seasonal fluctuations expressed as percentages of a 12 months moving average; that is, the data for each successive 12 months period were averaged and this average plotted on the chart as shown, at the point representing the center of the 12 month period. It is obvious that a figure obtained in such a way would show very little of the seasonal effect, and deviations of the data from this moving average were taken as the seasonal effect. These deviations were averaged for each month, leaving out the extreme items to obtain the average seasonal fluctuation shown on the chart mentioned above. It is worth noting that the seasonal fluctuations in the data are markedly regular from year to year on both the items under consideration.

The general trend of business activity is represented by the straight line running through the data. It will be noticed that the straight line growth appears to fit the data in both cases very well until the depression year 1931. The line was fitted mathematically to that part of the data between 1922 and 1931 and other figures are based upon the assumption that this was a normal and representative period. Whether or not the volume of business will tend to return to the old trend cannot be determined at the present time, but the comparison is nevertheless a valuable one.

A measure of the business cycle of the two items is presented in Figure 1040-4, which represents deviations in the volume of business from

the normal. By the normal is meant, in this case, the straight line trend modified by the mean seasonal fluctuation as mentioned above and plotted in connection with Table 1040-A.

TABLE 1040-A

Showing the mean seasonal fluctuations in the volume of cigarette and gasoline tax collections.

Month	Cigarettes	Gasoline
Jan.	86.0	80.6
Feb.	82.0	77.9
March	90.6	70.2
April	92.4	87.3
May	101.7	103.2
June	111.2	108.2
July	116.7	109.8
Aug.	115.0	120.1
Sept.	106.9	126.0
Oct.	101.0	114.7
Nov.	95.0	105.5
Dec.	101.2	89.5

Industrial Development of Iowa Counties

It is the opinion of the Committee on Business and Industry that a complete understanding of the industrial future of Iowa can be had only through a knowledge of the State's industrial past. What, for instance, were the leading businesses of yesterday? Which of these died; which lived? Why did some flourish; why did others die? The answers to these questions may show better the path to Iowa's future industrial development. Because of the size of the problem of presenting an adequate economic history of Iowa, the county unit has been used as the area of research. This has the advantage of presenting the material in complete units, so that one interested in a specific county or counties can disregard the material for the rest of the State.

At this time, the following counties have been studied:

Van Buren	Wapello
Dubuque	Story
Black Hawk	Montgomery
Cerro Gordo	Webster
Davis	Woodbury

It will be noticed that one county has been chosen in each Congressional District (two counties in the Fifth) thereby giving a state-wide sample.

The sources of information are county histories, newspapers, chamber of commerce publications, state historical publications such as Annals of Iowa and the Palimpsest, state publications, reports of the state and federal geological surveys, and the many reports of the U. S. Bureau of the Census. The volume of material for the counties varies from a scant amount for Van Buren to voluminous quantities for Dubuque.

The material will eventually be condensed into a short history for each of these counties. Special attention will be given to the natural resources and raw materials. Likewise, all known instances of industrial decadence will be carefully stated and, insofar as possible, explained. In the light of this past experience it is hoped that a more rational industrial future can be brought to Iowa.

#### INDUSTRIAL AND BUSINESS SURVEY OF JOHNSON COUNTY

To test the feasibility of a state-wide survey, the Committee on Business and Industry has conducted a preliminary study of a single county, Johnson County, Iowa. Enumerators obtained information in the manner contemplated for each of the 99 counties of the state. These data were then util-

RETAIL TRADING AND MARKETING AREAS

Fig. 1040-5

The maps in this figure show the trading areas for various types of consumer's good and market areas for two farm products in Johnson County.

A contemplated study of this nature in all the counties of the state will give the shift that has taken place in trade centers.







ized to prepare (1) an index of business activity in the county for the period 1925-1934, (2) a delineation of trading areas for various types of goods and of marketing areas for specific types of farm produce, (3) an analysis of changes in banking habits since 1930, and (4) an analysis of opportunities for industrial development within the county.

The accompanying reports are preliminary and subject to correction upon receipt of additional data. A large amount of additional interpretation is also possible and will be attempted in a later report.

#### Description and Location of Area

Johnson County is located in east-central Iowa. The county has been dominantly agricultural throughout its 95-year history. The principal crop is corn, nearly all of which is fed to hogs and cattle, the sale of which contributes most of the farm income. Most farmers also market considerable quantities of dairy and poultry products.

In Iowa City, the principal town and trading center, almost all interests are commercial. Manufacturing has never been a major activity. As the seat of the State University, Iowa City has become primarily a residential town, whose economic interests are divided between caring for University students and acting as a trading center for the surrounding agricultural area.

All other towns in the county are small rural communities, practically without economic interests other than those connected with the assembly and shipment of farm produce and the distribution of consumer goods to nearby farm families.

Adjacent counties contain a number of these small centers and one larger city (Cedar Rapids), whose trade territories include outlying portions of Johnson County.

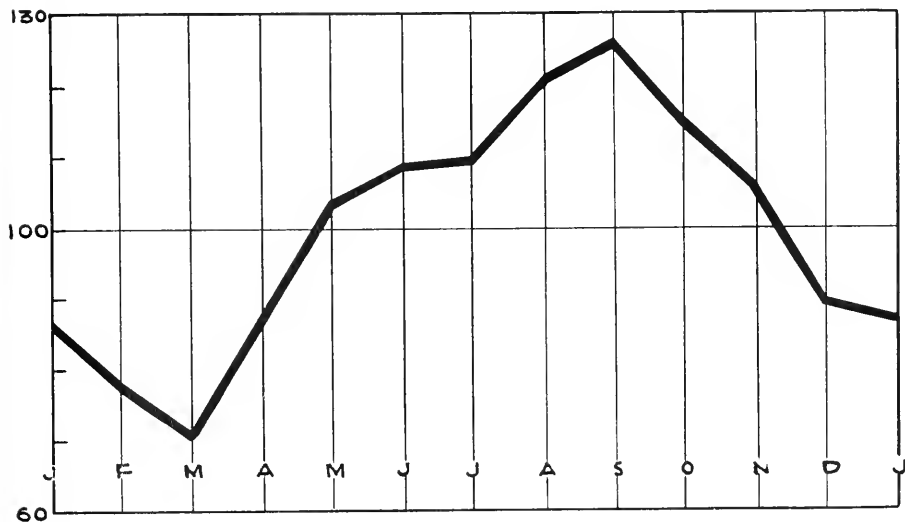
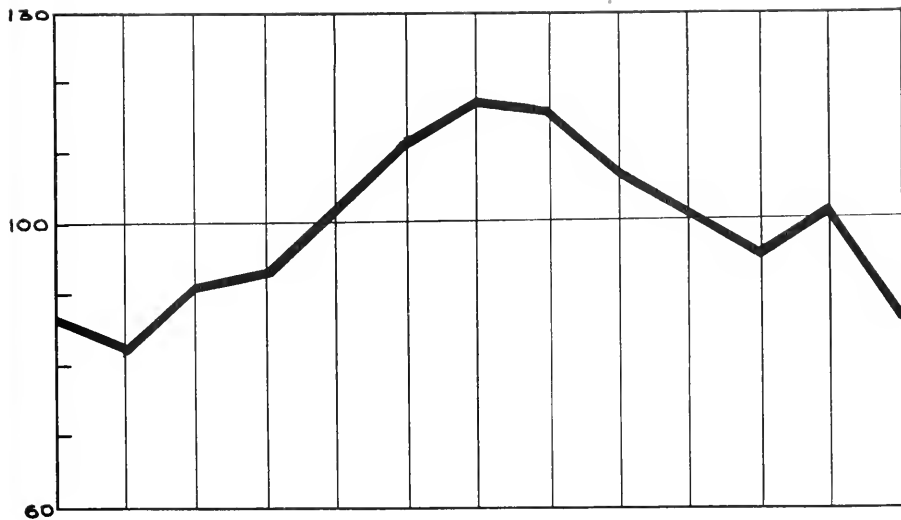
### Retail Trading Areas for Consumer Goods

Enumerators obtained information concerning retail market preferences from 114 rural consumers distributed throughout the area. The place of each enumeration is indicated on the accompanying maps. Information obtained was used in determining market areas for various specific types of goods. These areas are indicated on the maps.

Little comment is necessary upon the size and shape of these areas. Rural consumers apparently travel relatively short distances for convenience goods such as groceries, and for bulky or heavy commodities such as lumber and cement. Distances traveled for shipping goods, such as clothing, automobiles, drugs and medicines, are correspondingly greater.

The shape of the Iowa City trading area with its marked east-west skewness is worthy of comment. The presence of a larger major shopping center (Cedar Rapids) on the north accounts for the marked flattening of the north boundary, while the absence of such a competing center west of Iowa City accounts for the western extension of the area. Several small centers near the south and east boundaries of the county restrict the Iowa City territory for many types of goods in those sections.

A comparison of these rural trading areas with those of ten years ago shows but little change. One exception is in the trading area for men's suits. The 1934 Iowa City area for this commodity has grown over that of ten years ago by absorbing two outlying areas, which is probably accounted



AVERAGE SEASONAL FLUCTUATIONS  
IN SALES TAX RETURNS FOR  
CIGARETTES AND GASOLINE

1040-B



for by the disappearance of clothing dealers there.

Completion of enumeration in adjoining counties will permit a more accurate delineation of the trading areas of towns near the outer margins of the county. In addition, retailers and wholesalers will be canvassed in all the communities of the state in an effort to determine what these merchants consider their trade territories. These areas will be checked against those just described.

Urban consumers in Iowa City were asked for information similar to that gathered for rural areas. Enumeration of 79 families showed very little shopping outside Iowa City. Automobiles, furniture, and women's clothing are most frequently purchased elsewhere, but 90 per cent of the purchases of these articles are made locally. Apparently, there is a slight tendency for outside purchases of these items to increase, inasmuch as the percentage of such purchases in 1925 in no case exceeds 5 per cent. The completion of paved roads to larger shopping centers within the past ten years may have some bearing upon this shift. See Figure 1040-5.

#### Markets for Farm Produce

Market preferences for farm produce were obtained from the same persons who gave information concerning buying habits. The place of marketing hogs and cattle bears little relation to the place of buying consumer goods in Johnson County, but marketing centers for dairy and poultry products show closer correlation.

#### Banking Habits

In this enumeration an attempt was also made to discover changes in banking habits since 1930. The most startling result of this computation

is the marked decline in the number of persons carrying bank accounts. This decline was 75 per cent in Iowa City and 60 per cent in rural areas. When asked why banking connections were severed, 60 per cent stated that they had no need for a bank account, 30 per cent were influenced by losses in closed banks or by fear, and the remaining 10 per cent generally objected to service charges and other costs.

#### Industrial Development

Other committees of the Iowa State Planning Board are gathering a large amount of data concerning cost and availability of power, transportation facilities, the availability and qualifications of labor, and other information which will be utilized in preparing brief surveys of industrial opportunities in each county. In addition, this committee is gathering information concerning costs of fuel, unoccupied factory buildings, and other data. These materials are incomplete for Johnson County, but will be included in a later report.

#### AN ECONOMIC ANALYSIS OF PROPOSED NEW INDUSTRIES FOR THE STATE OF IOWA

Among the large number of proposals for the establishment of new industries in the state of Iowa, the most promising appear to be those which would utilize Iowa farm products as raw materials. The following analysis of the soy bean industry is the first of a series designed to bring together and analyze such information as is available on industries of this type. Other similar industries, some of which are mentioned at the end of this section, will be the subjects of future reports.

#### The Soy Bean Industry

The soy bean crop in Iowa is still of minor importance, since an aver-



age of less than one acre per farm is grown. The crop averages only from six-tenths to seven-tenths of one per cent of all land in crops in the 19 leading counties. Yet the crop is growing favorably, the acreage having increased from less than 500 in 1919, to more than 400,000 in 1934. Increases in the past three years have been stimulated by depression conditions.

The crop is best adapted to acid soils, and is finding most favor in the southeastern, north central and northeastern parts of the state. Nineteen counties in these areas produced 62 per cent of the 1932 crop. Soy beans are a more profitable crop than oats or timothy, and, on acid soils, more profitable than some clovers, although less profitable than corn or alfalfa. They rebuild the soil, are drought-resistant, and are practically immune to the chinch bug. Although subject to some plant diseases, soy beans have not been attacked in the United States.

More than 50 per cent of the Iowa crops have been cut as hay, and less than 50 per cent as seed and feed. The percentage cut as hay appears to be increasing. Seed requirements have been high, but may decrease with an improvement in economic conditions.

#### Oil Mills in Iowa

Oil extraction mills have been operated for several years at Centerville and Cedar Rapids. Neither mill has been able to buy many Iowa beans, and each has operated, at least during the past two years, on drastically reduced schedules. Each has an annual capacity of 100,000 bushels. One company with a re-conditioned storage elevator and a flax mill plans the purchase of 500,000 bushels of beans this year. Tentative plans for the promotion of another plant in Cedar Rapids call for an annual capacity of 750,000 bushels.

If this company is established, immediate requirements probably will not exceed 100,000 bushels.

The present annual capacity of Iowa soy bean mills amounts to 700,000 bushels. Mr. Charles D. Reed, Chief of Iowa Weather and Crop Bureau, estimates the harvest of beans this fall to be 100,000 acres, or about 1,400,000 bushels. It appears, however, that only a small percentage of these beans will reach commercial mill markets. Highly competitive conditions in the oil markets have tended to keep prices low and many farmers prefer to dispose of their crop through other channels.

#### Factors in Plant Location

The primary consideration in locating soy bean mills is nearness to the raw materials, coupled with good transportation facilities. The best locations are in the "down-stream" flow toward markets, where milling-in-transit rates apply.

The best markets for soy bean oil are found in the following industries: paint and varnish, edible oils, linoleum, and lard and butter substitutes. Inasmuch as most of the plants in these industries are located in the eastern portions of the United States, transportation costs place Iowa processors at considerable disadvantage in competing with plants in Indiana and Illinois.

#### Processes

The usual process in the United States is one in which the oil is expelled by high pressure in an apparatus which has the appearance of a meat grinder. Oil is expelled from the delivery end of the grinder. The process is continuous, and does not affect the feeding value of the resultant

meal. About five per cent of the oil is left in the bean.

A less frequently used process dissolves the oil out of the bean into a gasoline or naphtha solvent. When the solvent is evaporated, the oil remains. The objections to this system are that it is not yet perfected to a stage where all of the solvent is evaporated from the meal, which leaves the meal unsuitable for feed, and that losses of solvent are high and fire risks great.

Most foreign mills use the hydraulic press system. Beans are formed into cakes, placed on a press, and the oil expelled by the downward pressure of a heavy ram. The process is not continuous, and requires more labor than either of the others.

#### Costs of Milling

The United States Tariff Commission reported the cost of processing a bushel of beans to be 27.1 cents in the United States in 1923-24. At Japanese mills costs were 17.8 cents; at the mills of Great Britain, 15.5 cents; and at the mills of Dairen, Manchuria, 8.5 cents.

The smallest mill that can be economically operated must have an annual capacity of at least 100,000 bushels. A mill of this size will cost from \$30,000 to \$50,000. Dr. Sweeney, Iowa State College, and the Edison Institute advocate mills of this size located in producing areas, but many millers favor larger capacities. The Archer-Daniels-Midland Company attempted to operate a small mill in a producing area, but abandoned it. Mr. Eastman, president of the American Soy Bean Oil Manufacturers' Association, insists that a mill should have a large capacity (at least 350,000 bushels annually), be located in the "market stream" movement of large

amounts of beans, and provide extensive facilities for marketing. Advocates of the small plants believe the meal can be sold directly back to the farmer. Thus far, this method has not been found successful by Iowa plants, but such a market seems likely to develop in the future.

#### Rating of Location Factors

One of the largest processors in the Middle West rates transportation as the most important factor in plant location, and considers cost of power, water, and waste disposal facilities as more important than nearness to materials.

Several mills, on the other hand--and this opinion is shared by many authorities--have rated the factors in plant location as follows:

1. Nearness to materials; preferably on the "down-stream end of large bean shipments.
2. Transportation; milling-in-transit rates on beans and meal, and favorable rates on oil.
3. Power, water, waste disposal facilities.
4. Markets; apparently this factor has not been considered highly important in locating existing plants, but it doubtless will assume greater weight as the industry approaches maturity.

#### Iowa as a Location for Soy Bean Mills

It is apparent that nearness to the raw materials is of major importance in the location of these mills. As previously indicated, the Iowa production of beans is sufficient to support a considerable development of this industry, although expansion beyond existing capacities is questionable. Most of the Iowa crop is suitable for commercial purposes, but only a small

fraction has been reaching commercial channels in past years. Most farmers have preferred to utilize their bean crops for hay or to feed the beans. Soy beans are superior to other feeds as a high-protein ration, but if fed whole they tend to produce fatty meats and soft butter. These unfavorable results are largely eliminated through feeding the meal from beans from which the oil has been extracted. Recognition of this fact may encourage the development of mills in many localities. More serious is the fact that unless prices improve soy beans are not likely to remain in favor with Iowa farmers. Several other crops provide greater returns per acre, and in any return to a more nearly "normal" price structure for grains, these crops are likely to be favored.

Preceding paragraphs have indicated that Iowa locations are somewhat inferior to those of Indiana and Illinois because of greater distances from the major markets for the products. Any extensive increase in the demand for the oil, as seems likely in the paint and varnish industries, would, of course, tend to raise the price of the oil and work to the advantage of Iowa mills. On the other hand, large areas in states farther east might well be diverted to soy beans if prices were increased.

Increased non-agricultural demands for the meal are also a distinct possibility. Considerable quantities are now used in the manufacture of glue. Soy bean flour is being used by bakers and sausage mills. It is conceivable, although not highly probable, that the combined industrial and agricultural demands for meal may some day raise it to the position of major product, with oil as the chief by-product.

In considering other locational factors Iowa seems to suffer no dis-

advantages. Iowa mills now receive milling-in-transit rates from the railroads. Power, water and waste disposal likewise present no serious problems in the state.

Additional study of this problem should make possible more definite statements as to the probable success of new soy bean mills in the various sections of Iowa. Upon the basis of present information, however, it appears that the state might well observe and encourage existing plants rather than embark upon any elaborate program contemplating the building of additional mills.

#### Other Industries

Studies of other industries which might be developed upon the basis of Iowa farm products are in progress and will be included in later reports. Brief statements concerning several of these industries are contained in the following paragraphs.

Cornstalks on the farm are of little forage value, and their value as fertilizer is estimated at about two dollars per ton. Industries which can pay more than this amount, plus costs of collecting, baling, and shipping, can be assured of an almost unlimited supply in the state of Iowa.

It is believed that industrial plants might be profitable in the Middle West for converting the cellulose content of cornstalks into wall board, insulating and refrigeration board, and hard-pressed molded products.

Fermentation processes on corn will produce a long list of industrial alcohols and several acids which should find increasing application, although the extent of this market is highly dependent upon the price of corn relative to that of other acceptable raw materials. Increasing demands for lacquers

indicate an expanding market for butyl alcohol.

Experiments with artichokes in the mid-western states indicate their adaptability and high yield. Artichokes should have a relatively high industrial value in the preparation of pure levulose sugars and syrups.

Egg-cracking in conjunction with poultry dressing and egg receiving establishments has shown recent expansion in Iowa. Savings to be effected by this method of packing for shipment are obvious.

Information is now being gathered concerning the probable success of new industries of this type. Later reports will present analyses of these data.

PUBLIC SERVICE

Project 1051 - 1052

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## ELECTRIC SERVICES IN IOWA

While Iowa is primarily an agricultural state its continued economic development is to a large measure dependent upon the availability and use of a cheap source of power to run its factories, operate its machinery, and light its homes. If the average Iowa housewife is to be relieved of much of the unnecessary drudgery about the home, power must be available for home equipment at low rates, and the cost of such appliances must be brought within the range of the average purse. It is not enough to make these things available merely to the urban dweller; cheap power must be made available to Iowa's greatest industry--farming, and to the farm housewife.

The depression has resulted in the serious curtailment of electrical service in many communities. This has halted nearly all contemplated improvement of physical property and even materially interfered with proper maintenance in certain cases.

Much scattered information on electrical service is available from a number of sources. However, because no single organization is responsible for public service data in Iowa, it is impossible to get a complete and authoritative picture of the situation today. The Public Services Division of the State Planning Board will endeavor to gather pertinent information from various sources, all of which will contribute to an authoritative and unbiased study of electric service needs in Iowa, the available sources of electrical power, and the possible coordination and development of this utility with other public services in a manner which

will best serve both industry and the public.

### Development

Electrical service has been made available to the majority of Iowa communities within a relatively short span of years. In 1916 there were 415 towns served. This number was more than doubled by 1930 when 899 towns were listed as having electrical service. Only 22 towns were given as being without electrical service, and they had an average population of 115.

This widespread distribution of electrical power has been no small factor in Iowa's industrial development, and there can be no question about the part it will play in future industrial expansion. Likewise the fact that 99.9 per cent of our urban population have had electrical service available, has been a contributing factor in raising the Iowa standard of living.

The following summary gives the present state of electrical service in Iowa.

### Summary of Electric Service in Iowa

Number of towns having electric service	909
Total population of towns served electricity	1,442,764
Total urban population of state	1,444,214
Percentage of urban population having electric service available	99.9
Number of towns not having electric service	14
Average population of towns not served	115

Municipally Owned Electric Utilities

Number of towns generating and distributing electric service	58
Population of above towns	146,471
Number of towns distributing electric service energy purchased wholesale	69
Population of above towns	41,749
Total population served by municipal plants or systems	188,220
Per cent of total urban population served by municipal systems	13.0%
Per cent of total towns in state operating municipal electric systems	13.75%

The early studies of the Public Services Division have brought forcefully to mind the various agencies which have a certain measure of jurisdiction and responsibility for public utilities. The fact that there are so many of these agencies and that their jurisdiction has been divided has operated against the best interests of the utilities and of the public. It would seem logical that a competent and fair minded regulatory body might serve to a mutual advantage in centralizing the responsibilities and powers now given to numerous agencies.

Recommendations

With the wide publicity given to government to secure cheap power and bring electrical service to everyone, it is highly important that an accurate and unbiased picture be available of the electric services situation in Iowa. It is therefore recommended that the Electrical Services Survey be continued and carried to completion as rapidly as conditions will permit.

It is also recommended that further study be made of utility accounting practices with a view to working out simple and authoritative records which may be uniformly adopted.

A study of the possible extension of electric service to Iowa homes and industry is also suggested. This would involve research into the conditions under which maximum utilization of electric service might be expected consistent with a fair return to the plant.

A fourth recommendation is that methods of merchandising electrical equipment in Iowa be studied with a view to making reasonably priced electrical equipment available to a greater number of our people.

#### TELEPHONE COMMUNICATION IN IOWA

While 570,000 telephones were reported in the state in the industrial survey of 1930, this figure has doubtless been appreciably lowered by the depression. At that time, the Des Moines exchange was reported to serve 43,200 telephones, Sioux City 18,700, Davenport 18,500, Cedar Rapids 17,200, Waterloo 12,000 and Dubuque 11,000. Six exchanges served more than 10,000 telephones, eight had from 5,000 to 10,000, five had 3,000 to 5,000, thirty-two had 1,000 to 3,000, and thirty-six had 500 to 1,000 telephones. The Northwestern Bell Telephone Company operated in 159 cities and towns in the state while independent telephone companies operated in 778.

Many exchanges located in communities stricken by both the depression and the 1934 drought have suffered serious reductions in the number of subscribers served. It is the purpose of the present State Planning Board study to determine the present actual conditions, the effects of the depression on the telephone industry, and possible steps which may be taken to improve the situation from the standpoint both of the operating companies and of service to the people of the state.

### Iowa's Telephone System

Iowa stands in the front rank in telephone development according to information disclosed in the Iowa Industrial Survey of 1930. Pre-eminently an agricultural state, Iowa stood first in the nation and in the world in rural telephone development, with 86 per cent of its farms reached by telephone. The state was also first in residence phone development, with one residence phone to every 5.3 persons--almost one to a family.

When business and office phones were included, three other states surpassed Iowa. These were California with 24.2 telephones per 100 population, Illinois with 23.7, and New York with 23.3. Iowa had 23.0. The larger number in the first three named states was explained by the extensive telephone utilization in the hotels and business institutions of the large cities.

The number of telephones in Iowa was listed at 570,000 by Mr. Roy H. Gustafson, Informational Activities Supervisor of the Northwestern Bell System for the Iowa Industrial Survey. Two hundred seventy-two thousand four hundred of these were listed as owned and operated by the Northwestern Bell Company. Two hundred ninety-seven thousand six hundred telephones were owned and operated in the state by 536 independent telephone companies.

### Telephone Development in Iowa

The first telephones were brought to Iowa 77 years ago by George B. Engle, Jr. who came to Cedar Rapids in 1877. The exchange for the Dubuque Telephone Company was opened in June, 1879. The first private

telephone exchange in the state was probably one constructed by Mr. Engle for the City of Burlington in 1878.

The Cedar Rapids exchange opened for service in 1880. This date marked the beginning of a period of rapid expansion in the telephone industry. The fundamental Bell Telephone patents expired in 1893, and within a few years practically every town and city in Iowa was served by telephone.

Iowa is well served by a network of long distance telephone lines, reaching practically every city, town and community in Iowa, and connecting with other telephones all over the world. A number of major long distance lines traverse the state. Among these are the east and west line from Dubuque through Waterloo and Sioux City, the central trans-continental line which enters the state at Davenport, and passes through Iowa City, Des Moines and Council Bluffs, and a third east and west line from Sioux City through Mason City.

Among the important north and south lines are: one south from Council Bluffs to St. Joseph and Kansas City, one north from Council Bluffs through Sioux City, one north and one south from Des Moines, one north through Cedar Rapids and Waterloo, and another south from Davenport through Burlington.

#### THE SURVEY OF INDEPENDENT TELEPHONE COMPANIES

The Telephone Survey party is endeavoring to secure information on the trend of the number of telephone subscribers since the depression, the effect of telephone rates on subscriber totals, the type and con-

dition of the physical plant and system, and the possible expansion of telephone service.

The Public Services committee has contacted, to date, approximately one hundred towns and cities in the state securing information on the telephone communication systems. The companies contacted have consisted of mutual companies, private companies operating in but one town, and larger companies which own and operate a number of exchanges throughout the state. In the main they have cooperated very well with the State Planning Board in this survey, which should be of benefit both to operating companies and the public. A few companies have refused to cooperate with the State Planning Board in securing an unbiased study of this important monopoly of public service. It is to be hoped that this situation may change inasmuch as such a study can be equally helpful to the operating company (be it private or mutual) and to the public using telephone service.

Five hundred and thirty-six Independent Companies were reported as operating 778 telephone exchanges by Secretary C. C. Deering of the Association in 1930. There have doubtless been significant changes since the depression which will be disclosed by the present State Planning Board survey.

Most of the 100 exchanges visited have connections with the Bell Telephone System. A number have arrangements with the Postal Telegraph Company or the Western Union Telegraph Company for handling telegraph messages. In a large number of instances the telephone company provides switching service for a number of farm lines which are owned by the

subscribers on the lines.

While the survey is still in its early stages a sufficient number of communities in different parts of the state have been studied so that certain facts are becoming increasingly apparent. Because the independent telephone business is of huge proportions in Iowa, reaching hundreds of thousands of people, these trends are of the utmost significance and importance.

#### Free Service

The survey has revealed the fact that most of the companies operate "free service" lines to other towns in adjacent territory. Usually each company owns half the line to the connecting exchanges. These lines are in practically all cases grounded circuits of iron wire. It is frequently possible to build up connections so that subscribers may talk to as many as thirty towns, even though the transmission in some cases may be of doubtful quality, requiring "repeating" by the operators.

Because of reciprocal relations between companies no charge is made to subscribers for this service. Many companies have expressed their dissatisfaction with these "free service" lines but feel that they are forced to provide them because other companies do so. This would seem to be a condition which might be altered by cooperative action of the companies in the association. If these lines were made metallic and maintained in first class condition, a charge might be made for their use which would aid the companies very materially in maintaining the condition of their plants.

It would seem that the independent companies are overlooking a



possible source of income in making no charge for this service which really amounts to toll service.

#### Employment

The independent telephone companies operating in Iowa reported 4100 employees in 1930. Nearly two-thirds of this number were women. The decrease in the number of subscribers in recent years had little, if any, effect on the number of employees of the various independent telephone companies. Most of the companies are reporting the same number of employees that they had in 1929. Salaries have, however, been drastically reduced. In some cases whole families are employed for \$45.00 per month or less.

It is therefore obvious that the business is not likely to absorb many more employees should prosperous times return. However, were conditions such as to permit much needed rebuilding and new construction, there is no doubt but that a moderate amount of additional employment would result.

#### Plant Improvement

With many of the switchboards and much physical equipment worn out and obsolete, there can be no question about the need for rebuilding and new construction. The managers of many companies have stated that they would like to replace poles, wire, cable, switchboards and other items if they had the money. There is much to be done and there will be a large market for all types of telephone equipment when economic conditions improve.

One specific example may be mentioned where there is opportunity

for surprising improvement in service at a reasonable cost. Nearly every company has reported some lines where the inductive interference was excessive at times. In most cases, these lines parallel power transmission lines. The advantages of metallicizing circuits to remedy this condition are so well known that doubtless many companies will make this improvement when times permit.

Some thought should also be given to the number of subscribers on rural lines. No matter how well the equipment and the plant are maintained, satisfactory service cannot be given on lines with twenty subscribers.

#### Consolidation

The telephone companies in Iowa quite obviously vary from the extremely small exchanges with a few lines to the large corporate owned systems. Some of the very small companies are operated equally as efficiently as the large ones. There are a number of small exchanges managed by persons having other business interests. In some cases these do not receive the attention required for successful operation. And in this business as in all others, competent and intelligent management is an absolute essential for efficient operation. In contemplating the future of this industry in the state it is probable that some of the small companies operating in adjacent territory could consolidate to their mutual advantage. Such consolidation would often permit the payment of adequate salaries for competent management which would be unwarranted in the small individual exchange.

### RECOMMENDATIONS

It is recommended that the Independent Telephone Survey be continued and carried to completion. A similar study of the Northwestern Bell Telephone System should be made. This material can probably be secured almost in its entirety from the company offices in Des Moines.

It is suggested that an educational program be worked out with a view to acquainting the public with the factors making up telephone service costs.

A thorough study of telephone accounting practices in Iowa is also recommended, for the purpose of developing a simple and effective system of accounting to be uniformly adopted by the telephone companies of the state.

### RADIO COMMUNICATION IN IOWA

Iowa is served at the present time by eleven commercial, three educational, one religious, five police and four aviation radio broadcasting stations located within the state and by a number of other stations located outside the state borders.

It is the purpose of the present survey to study the adequacy and coverage of the present facilities and to suggest possible developments, changes, and extensions which will make for better radio service in the state.

### RADIO HISTORY

The radio industry has attained such a high degree of development today that it is difficult to remember it as the struggling infant of only

a few years ago. Yet to understand the present radio broadcasting situation in Iowa it is necessary to know something of that background. The first sizeable radio broadcasting station in Iowa was erected in 1921. By 1926 the broadcasting field had become the center of such bitter controversy regarding power, wave length, and broadcasting privileges that federal control was necessary. A few stations were jumping from wave length to wave length at will and increasing their sending power indiscriminantly, thus blanketing some stations from certain areas and practically eliminating others. The result was utter chaos both for the radio industry and for the public in general.

The Radio Act of 1927 was intended to correct existing evils and to bring order into the broadcasting field. It divided the United States into five zones with a commissioner appointed from each. Radio broadcast facilities have been allocated among the various zones and the states within each zone in accordance with Section 9 of the act as amended and through regulations promulgated by the Commission. For this purpose each station is evaluated in quota units. A total of 400 units is divided equally among the five zones. The 80 units allotted each zone are prorated among the states according to population. For further study it will be helpful to consider the various types of station and the service rendered to the state.

#### COMMERCIAL BROADCASTING STATIONS

Iowa is fairly well covered by commercial stations located within the state. The southern two-thirds of the state is exceptionally well covered by a number of stations. The coverage of northern Iowa by Iowa

stations is augmented to a large extent by powerful stations located outside the state.

While it is customary to indicate the coverage area of a station as a circle, as a matter of fact the field area is often far from circular and may follow one or a combination of a number of plane geometric patterns. These field patterns are influenced by the type and construction of the transmitting antenna, by nearby buildings and other obstructions, and by the antenna towers. They can be obtained by making a strength survey in the field. (See Figure 1051-1)

It is evident, therefore, that a station manager may be grossly misled regarding his effective coverage area by reports from one or two directions at much greater distances than the power and frequency of the station warrants. This is often due to peculiar conditions in the antenna construction of the transmitting station or to "freak" circumstances that prevail at the receiving station.

Making allowances for variations in the actual-field coverage of Iowa stations, it is still apparent that the state is rather completely covered, and that the commercial radio station has become a powerful agency for carrying advertising to the people of Iowa. There can be no doubt as to its possible service to business and industry.

Much of the criticism of the commercial radio station is based on the abuse of its function as an advertising medium. While advertising is the dominant and sole function of most commercial broadcasting, this advertising is sold through entertainment and educational features. It is just coming to be recognized that because of its very nature the radio has

COMMERCIAL RADIO STATIONS

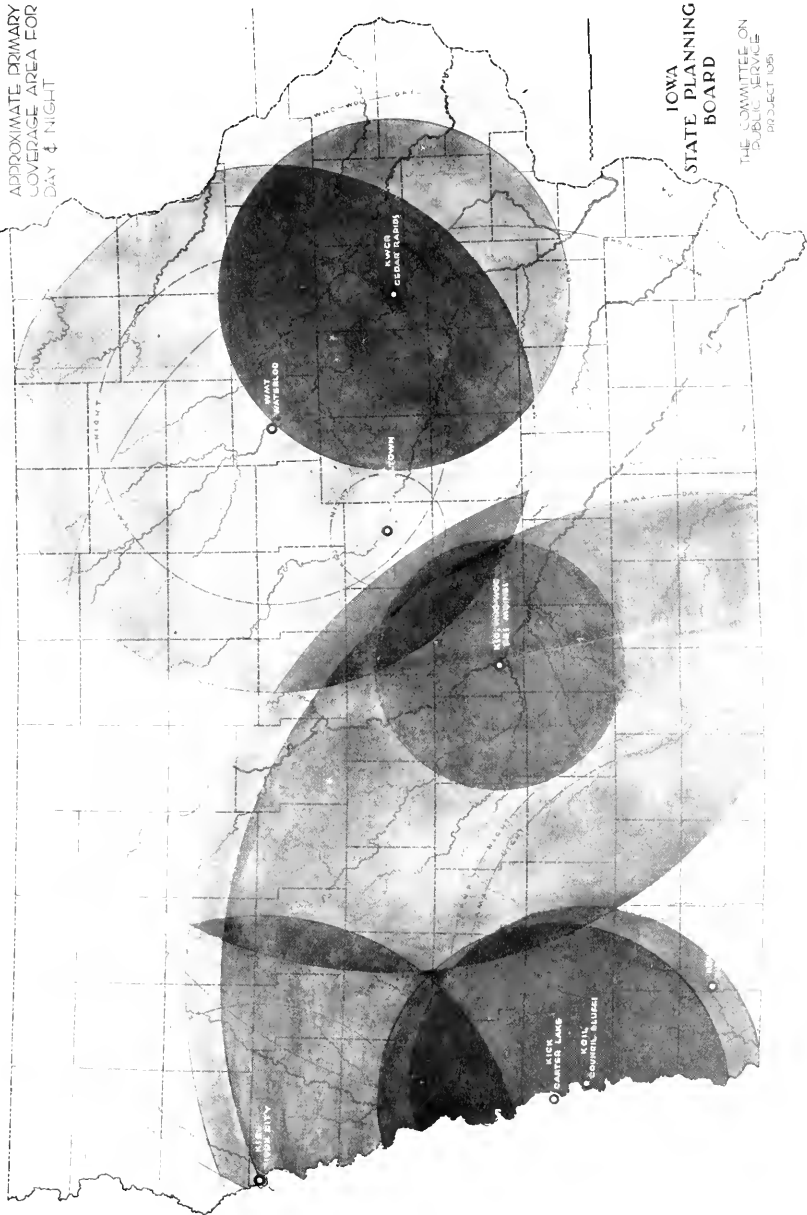
Fig. 1051-1

This map shows the commercial radio stations located in Iowa and the areas of their coverage.

While it is customary to indicate the coverage area of a station as a circle the field area is often far from circular and may follow one or a combination of a number of plane geometric patterns.

# COMMERCIAL RADIO STATIONS

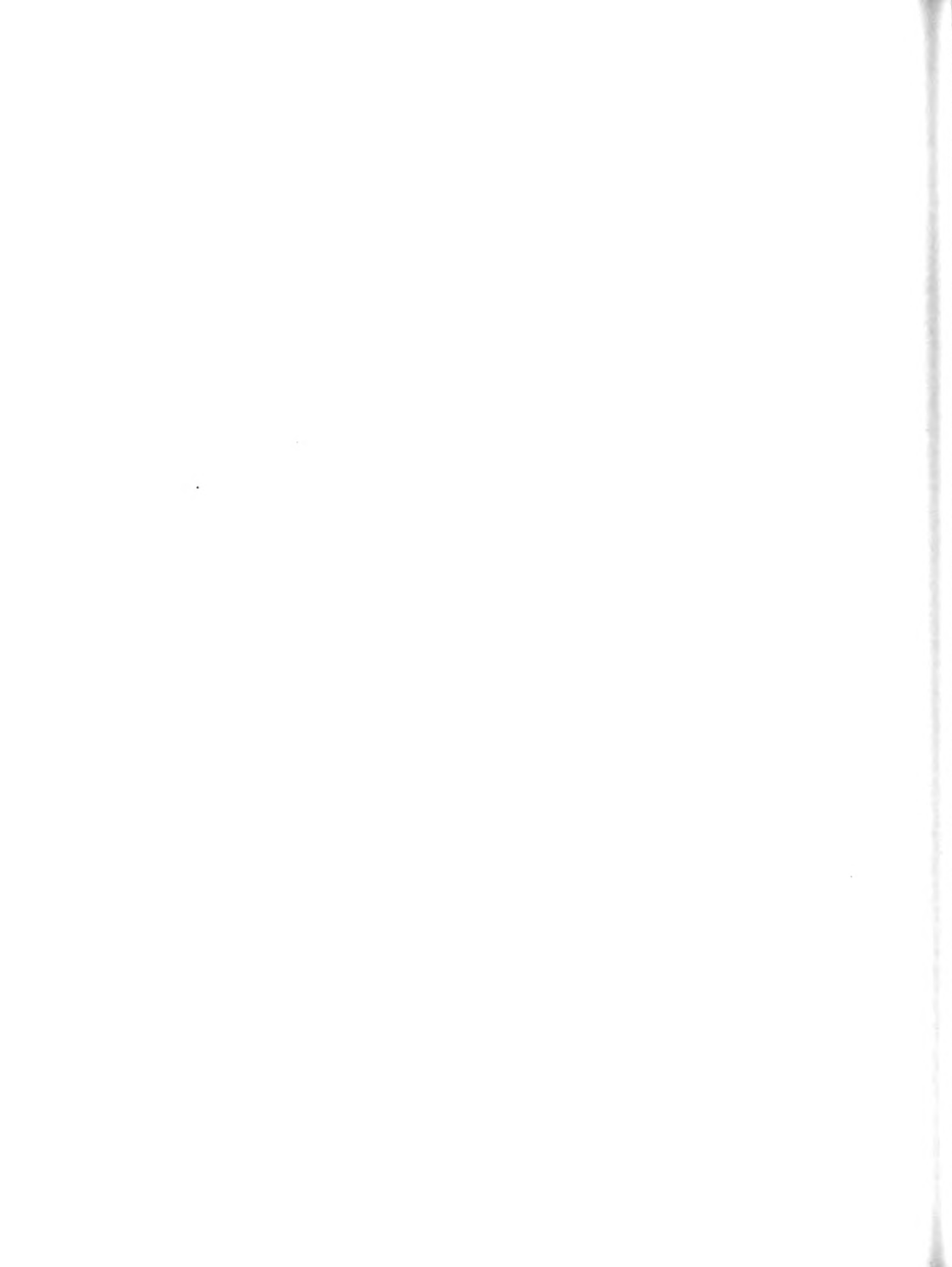
APPROXIMATE PRIMARY  
COVERAGE AREA FOR  
DAY & NIGHT



IOWA  
 STATE PLANNING  
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THE COMMITTEE ON  
PUBLIC SERVICE  
PROJECT 1051

1051-1





REPORTED COVERAGE AREAS  
IOWA RADIO BROADCASTING STATIONS

Coverage Indicated by  
Radius in Miles

Station	City	Primary Coverage		Secondary Coverage	
		Day	Night	Day	Night
WOI	Ames	100		150	
KFGQ	Boone	60		100	
KICK	Carter Lake	50	25	60	25
KWCR	Cedar Rapids	50	Linn Co.	100	Linn Co.
KOIL	Council Bluffs	50	50	75	75
KGCA	Decorah	50		100	
KWLC	Decorah	50		100	
KSO	Des Moines	35	Polk Co.	60	Polk Co.
WOC-WHO	Des Moines	165	125 (Est.)	300	U. S.
WSUI	Iowa City	75	50	100	60
KFJB	Marshalltown	125	Marshall Co.	175	Marshall Co.
KFNF	Shenandoah	150	75	200	75
KMA	Shenandoah	140	70	200	75
KSCJ	Sioux City	75	50	150	50
WMT	Waterloo*	75	50	150	50

\*Estimated as of August 15, 1934

## POLICE RADIO STATIONS

Fig. 1051-2

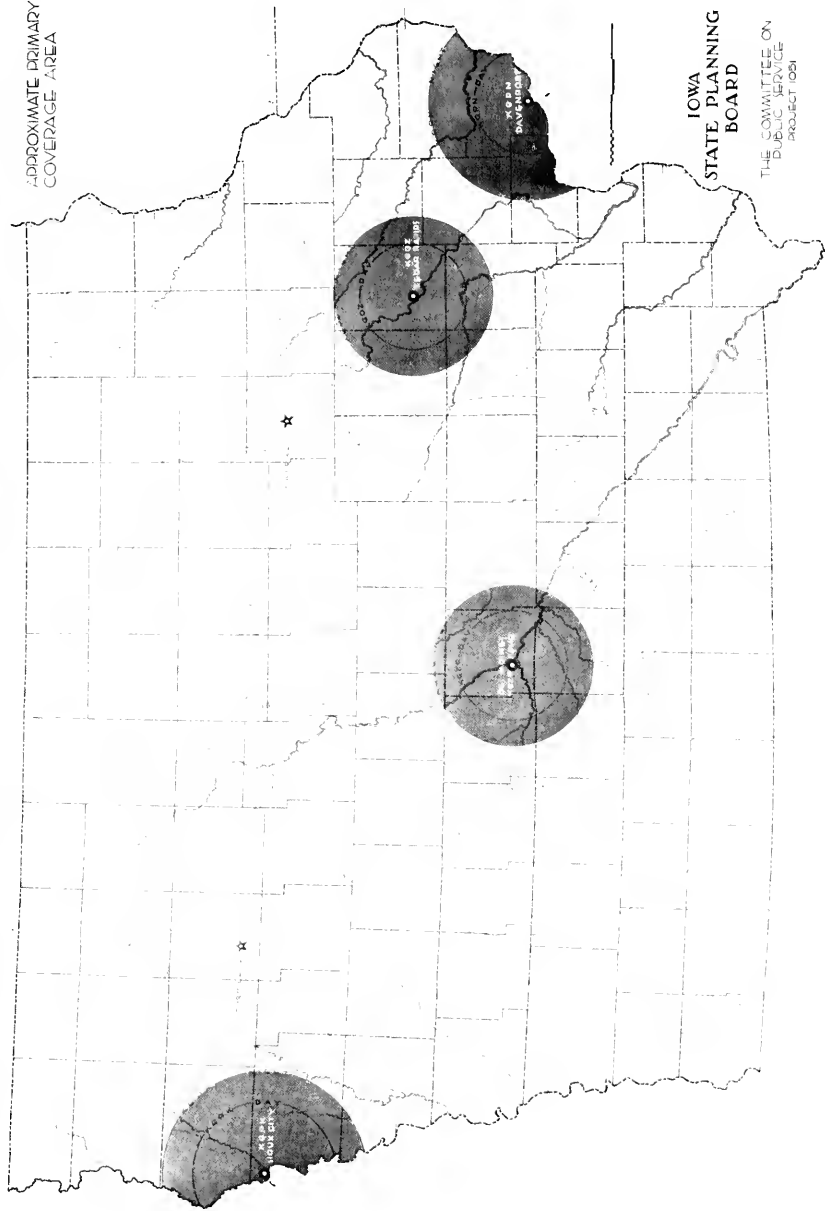
Shown on the opposite map are Iowa's five police radio stations. Four of these stations are municipally owned and one, KGHO, is a state owned station.

The present state police station, located at Des Moines, is the first unit of a contemplated system reaching all parts of the state.

# IOWA STATE PLAN

# POLICE RADIO STATIONS

APPROXIMATE PRIMARY  
COVERAGE AREA



IOWA  
STATE PLANNING  
BOARD

THE COMMITTEE ON  
PUBLIC SAFETY  
PROJECT 1001

1051-2



a responsibility to the public. Just as the public has been aroused to demand a clean-up of motion pictures, so will it demand the elimination of fraudulent advertising, the reduction of "spot" advertising, and the removal of harmful programs from the air. To serve the Iowa home and family as well as the sponsoring advertiser this change in policy must be made. A number of progressive Iowa stations are already recognizing this responsibility and are making a distinct effort to eliminate harmful advertising and to provide better types of drama and music.

#### EDUCATIONAL BROADCASTING FACILITIES

To meet the educational needs of the Iowa radio public is the primary function of four radio stations, WOI at Ames, WSUI at Iowa City, KWLC at Decorah, and KFGQ at Boone. (See Figure 1051-3) WOI at the Iowa State College, Ames, with 5000 watts power, has been allotted daylight time. WSUI at the State University, Iowa City, with 500 watts power, has an allotment of specified day and night hours. KWLC at Luther College, Decorah, with 100 watts shares time with KGCA, and is allotted four hours per day. KFGQ at the Boone Biblical College has been allotted specified daylight hours.

A study of the power assigned to commercial and educational stations discloses some interesting facts. Of a total of 62,750 watts daylight power allotted on January 1, 1934, only 5,700 watts was to educational stations. Of 54,500 watts total night power only 500 watts was assigned to educational stations. By August 15 of this year, daylight power to commercial stations had been increased from 57,050 watts to 62,450 watts,

#### EDUCATIONAL RADIO STATIONS

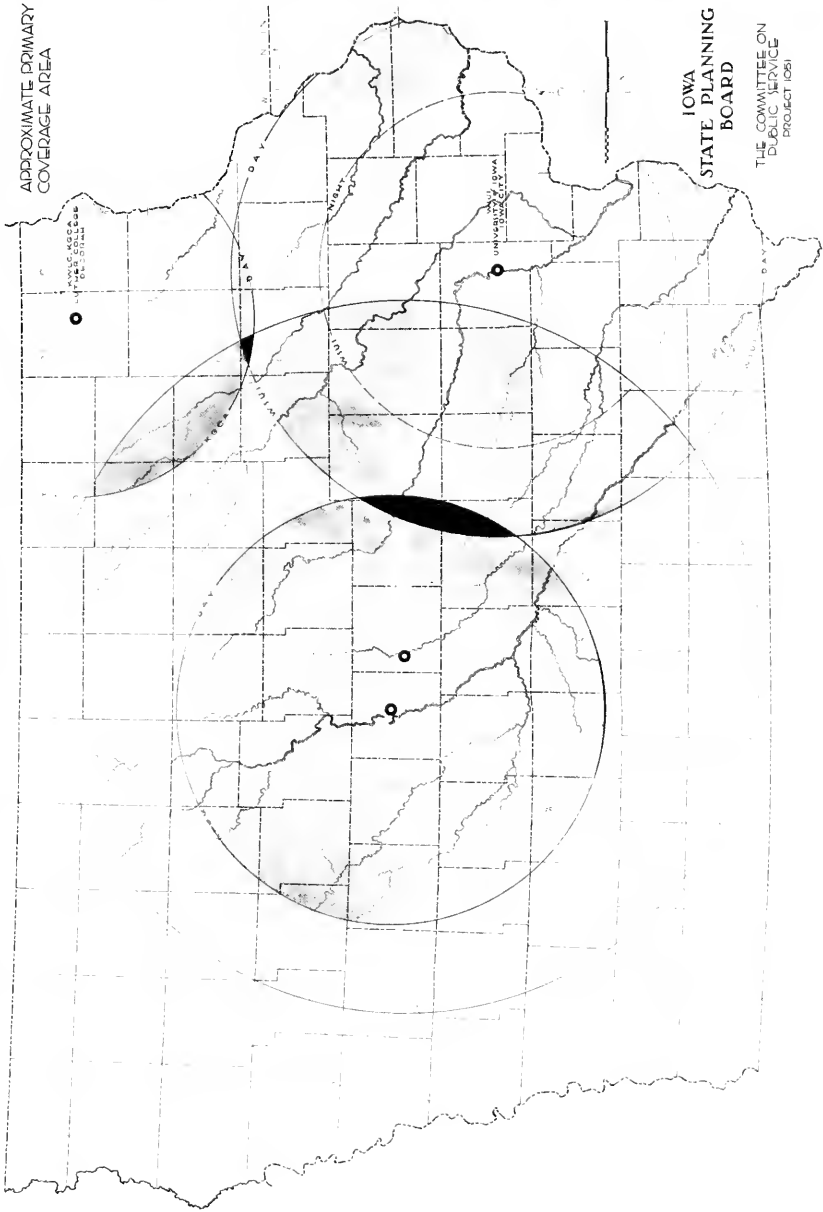
Fig. 1051-3

Institutions of learning in Iowa have been able to extend their services many miles beyond the walls of their class rooms through the facilities of the four educational radio stations shown on the accompanying map.

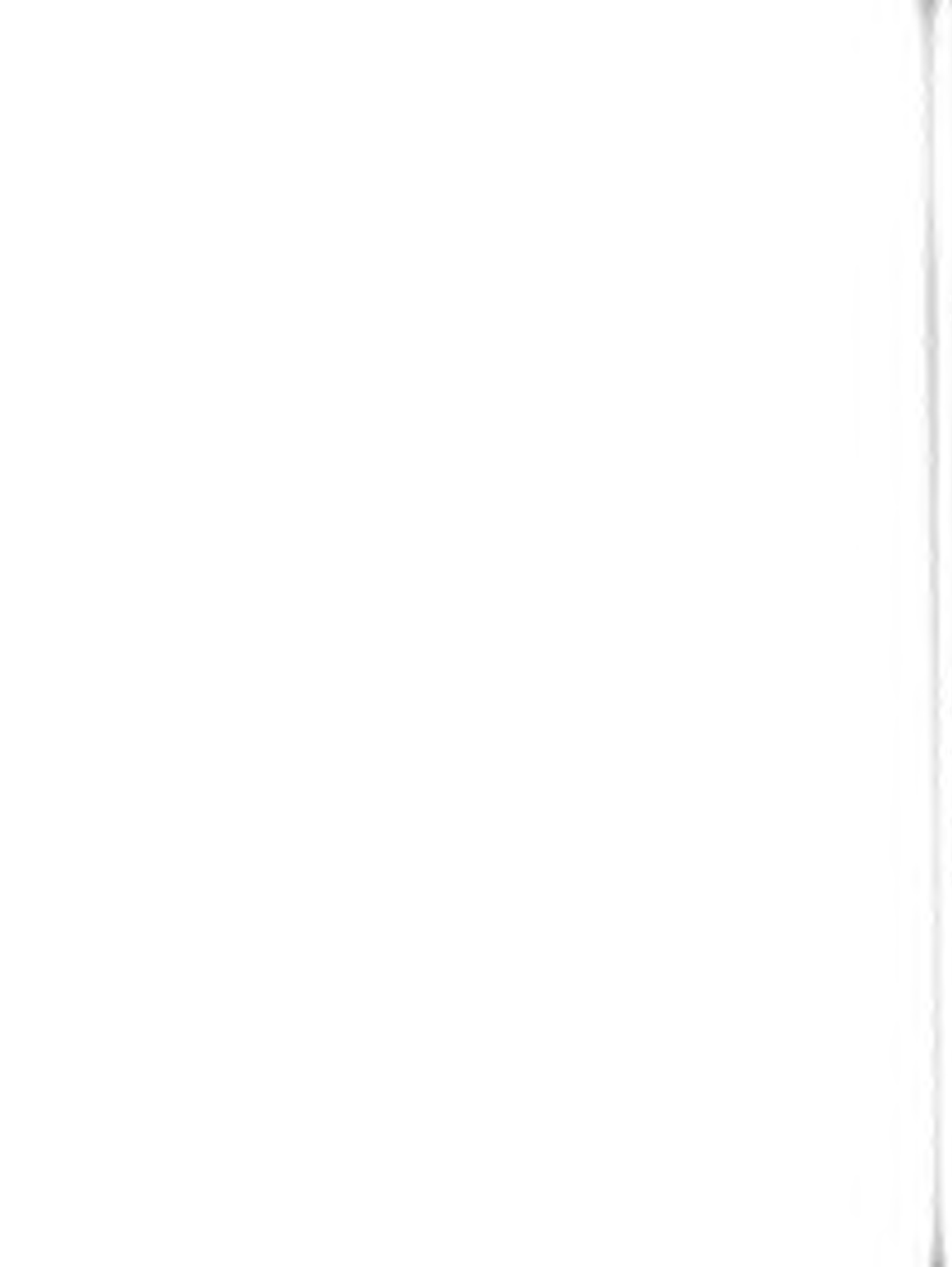
The station with the largest coverage is WOI, the broadcasting station of Iowa State College.

# IOWA STATE PLAN EDUCATIONAL RADIO STATIONS

APPROXIMATE BOUNDARY  
COVERAGE AREA



1051-3





and night operating power from 54,500 watts to 55,200. The power allotment of educational stations remained the same during this period. Hence on August 15th 91.6 per cent of daylight power and 99.1 per cent of night broadcasting power was devoted to commercial use. Educational stations were thus given 8.4 per cent and .9 per cent respectively of available daylight and night power in Iowa.

Governor Clyde L. Herring has recently suggested the consolidation of the educational and service radio broadcasting needs of the state, through a central sending station at Ames with wires to the State Capitol, the State University and the State Teachers College. A consolidation of police radio service covering the state is also contemplated. Improved service to the people of Iowa at lower cost is claimed for the proposal, which is receiving serious consideration and study at the Governor's direction.

#### AVIATION RADIO FACILITIES

At the present time there are four aviation radio stations in Iowa. Two are owned and operated by the Bureau of Air Navigation of the United States Department of Commerce. A station at Iowa City broadcasts weather and other aviation information. It acts as a service agency for itinerant aircraft, giving out information and directions on call. A government radio range station at Burlington is entirely automatic and operates continuously. A caretaker visits the station at scheduled hours during the day and night. A signal is provided to call the attendant in case of emergency.

Two aviation radio stations in Iowa are owned and operated by the United Air Lines, and are used solely, except in emergencies, for the guidance and direction of company owned aircraft.

These stations, located at Des Moines and Iowa City, are able to contact aircraft in their working districts, even under fairly adverse conditions during the day. At night, with different frequency, the range is increased to such an extent that contact may be made under normal conditions with company land stations several hundred miles distant.

#### POLICE RADIO FACILITIES

The present state police radio station located at Des Moines is the first unit of a contemplated system reaching all parts of the state. (See Figure 1051-2) A number of other transmitters have been proposed to be located strategically over the state. This system would link all county peace officials with the State Bureau of Criminal Investigation. The existing station does not cover the entire state at all times, and the expenditure of a considerable sum will be needed to complete the contemplated system and bring it up to desired standards of effectiveness.

One recent suggestion in connection with the proposed merger of the state educational broadcasting facilities, has been that these facilities be used to supplement the existing state police system. This proposal has the merit of apparent economy, for the immediate future at least. There are serious drawbacks, however. There is considerable doubt about the advisability of carrying on the usual police communications on the regular broadcast frequency. There is also much question about the

practicality of mixing police announcements and routine directions with an educational program.

The erection of a high power police transmitter at some central point with a frequency just below the broadcast band has been suggested as the most satisfactory solution as to both cost and results in the long run. This is an important matter, and one which warrants exhaustive study.

#### COMMENTS

The situation of the commercial broadcasting stations in Iowa is becoming fairly well settled, so that only minor shifts may be expected in the immediate future. The small commercial station of relatively low power is finding a definite place for itself, and is discovering that by proper management and program selection it can build up popularity with its local audience to an even greater degree than can the large station. This is doubtless explained by the fact that the large station must build its program to appeal to a widespread cosmopolitan audience, whereas the small station covers a smaller territory and consequently has less variety of tastes to which it must appeal.

#### RECOMMENDATIONS

The committee recommends that the survey of Iowa radio communication be carried to completion and that suggestions be made, based on this study, for the improvement of radio broadcasting services in the state.

#### GAS SERVICES IN IOWA

Gas service, although not as large as to value of plant and equipment,

## GAS SERVICE

Fig. 1051-4

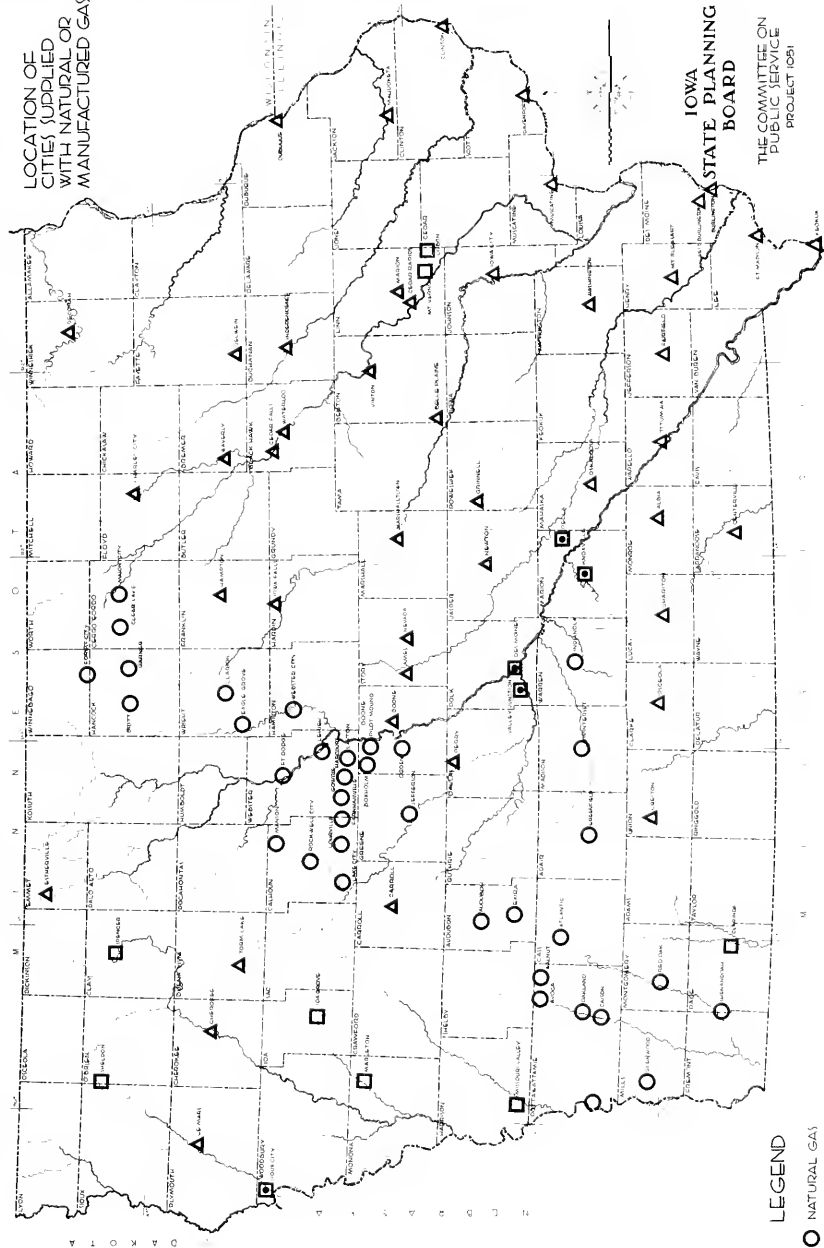
Shown on the opposite map are the various types of gas in use by cities throughout the state.

Manufactured gas has been the most common in the past but with the extension of pipe lines into Iowa, from gas fields in Oklahoma and Kansas, the use of natural gas is becoming more common.

# IOWA STATE PLAN

# GAS SERVICE

LOCATION OF  
CITIES (SUPPLIED  
WITH NATURAL OR  
MANUFACTURED GAS)



## LEGEND

- NATURAL GAS
- MIXED GAS
- △ MANUFACTURED GAS
- ◇ BUTANE GAS

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PROJECT 1051

1051-4



gross revenue, or population served as the electric service, is becoming one of the major home service industries of the state.

Gas is classified according to those types having general distribution facilities and plants into six main types or kinds: natural, water, coal, butane, mixed, and tank gas.

Natural gas is drawn from wells in Kansas, Arkansas, Oklahoma and Texas and piped under pressure to distribution points from a few to several hundred miles away. Iowa is served with natural gas by two great natural gas pipe lines crossing the state. The line of the Northern Gas and Pipe Line Company enters the state some miles south of Council Bluffs and runs in a northeasterly direction across the state crossing into Minnesota north of Mason City. The second large pipe line owned by the Natural Gas Pipe Line Company of America enters the state at the same point as the first and leaves south of Muscatine. Each of these main lines have numerous lateral leads and meter sites serving local towns and cities. (See Figure 1051-4)

Water gas is produced in a manufacturing plant from coal, and in general is made for local distribution only.

Coal gas is produced in manufacturing plants from coal in much the same manner as water gas. These two types of gas have been the most common types used in the state because they could be developed as individual units producing gas for local distribution. We have in Iowa, however, two comparatively short pipe lines transporting these types of gas to other towns and cities for local distribution. Much of the field formerly served by this gas is now served by the newer natural gas pipe lines.

The Development of Gas Service in Iowa

Gas service in Iowa, as well as in most other sections of the country, preceded electric service by some years. Such service was originally mainly for lighting, price prohibiting to a large extent its use for heating. With the incoming of more economical electric service with its greater availability and convenience, the many small gas systems scattered throughout the state deteriorated and passed out of existence. Later more economical methods of producing manufactured gas were devised and plants were built or rebuilt and systems planned so that this gas could be made available for domestic and commercial use. While gas is used for lighting, it probably is used more extensively than electricity only for heating.

With the incoming of natural gas in 1930-1931 the gas industry in Iowa was given great encouragement. A large number of towns were served with gas; gas service in most instances was reduced in cost and could economically be used for house heating, industrial firing, etc.

Butane gas has been developed the past few years but is used in only a limited number of locations, eight towns and cities being served in 1933. The use of tank gas has increased in rural and suburban communities not otherwise served the past few years. The extent to which such gas is used will be hard if not impossible to determine.

Following is a summary of the present gas service in Iowa from general data available at the present time:



## GAS SERVICE IN IOWA

October, 1933

Number of Towns Having Gas Service	95
Total Population of Towns Having Gas Service	971,928
Total Urban Population of State	1,444,214
Percentage of Urban Population Having Gas Service Available	67.3
Number of Towns Served with Manufactured Gas	45
Number of Towns Served with Natural Gas	37
Number of Towns Served with Butane Gas	8
Number of Towns Served with Mixed Gas	5
Number of Incorporated Towns in State	923
Percentage of Towns Having Gas Service	10.3
Number of Miles of Natural Gas Pipe Line in State	730
(Some have been laid since this data)	

From Records of the Iowa Public Utility Association

### THE GAS SERVICE SURVEY

In securing authoritative information in this field the Public Service Division has under way the collection of data on: gas generating plants in Iowa, gas pipe lines, gas distribution systems, and all available data on individual consumer gas sets or systems.

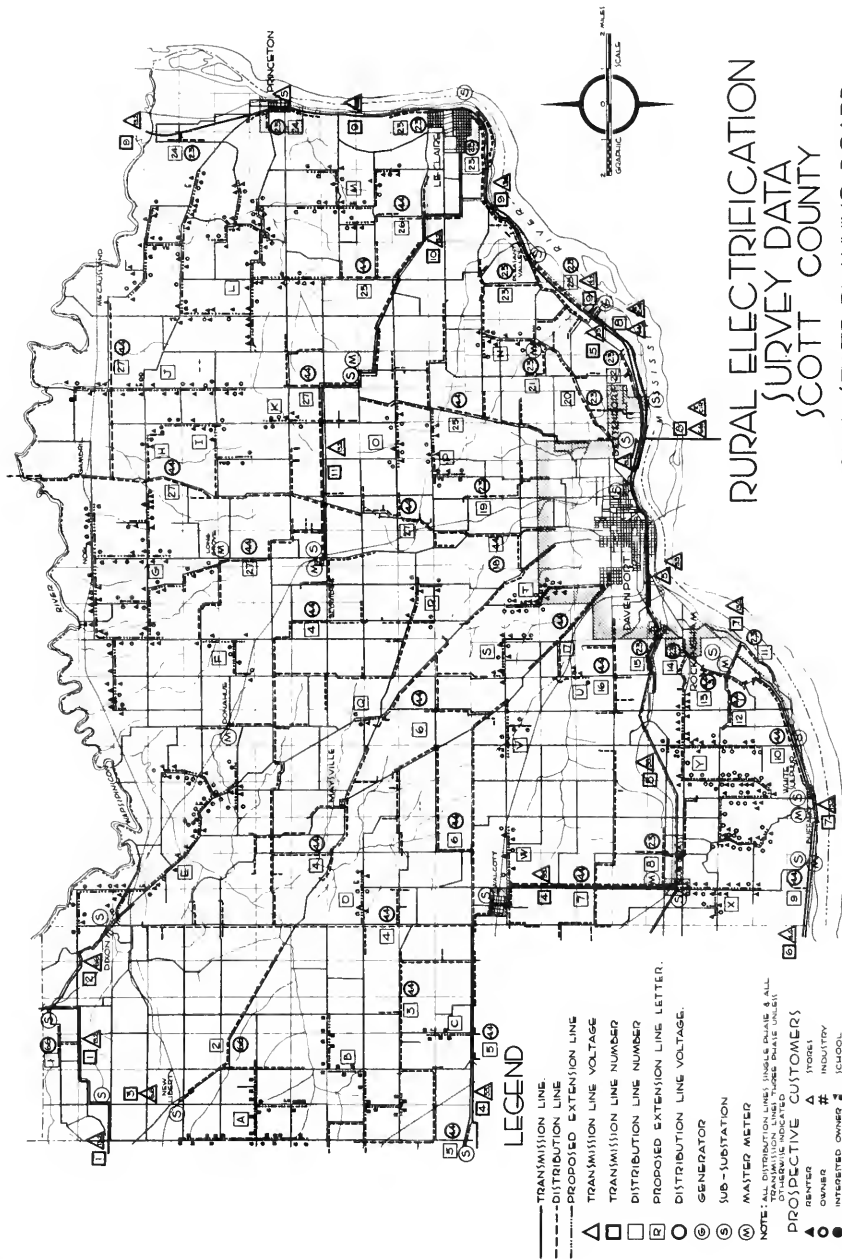
In that the information concerning this public service resembles very closely that of the electric service, much the same methods and sources of materials have been used in its collection. As already discussed in the section on electric service, no public or private agency in Iowa keeps information of a specific or detailed nature on these services or industries. General information is available only to a limited extent, similar in amount to that concerning electricity. The files and records of the individual operating group hold much of the information needed by the survey.

# RURAL ELECTRIFICATION SURVEY DATA

## SCOTT COUNTY, IOWA

Fig. 1052-1

This map shows the extent of the present power development, the proposed extensions, and prospective customers along these extensions. The legend on the map explains all symbols used in indicating power lines and prospective customers. Similar information has been secured for the following nine counties: Benton, Davis, Fayette, Madison, Mitchell, Shelby, Sioux, Story and Webster. Although Scott County has been developed as much as any of these counties, there are still approximately 120 miles of extensions which appear to be very feasible. For this reason Scott County was considered as being a typical example of the work. Letters and figures not explained in the legend refer to data which have been filed in a supplementary volume but which have not been included in this preliminary report.



# LEGEND

- TRANSMISSION LINE
- - - - - PROPOSED EXTENSION LINE
- TRANSMISSION LINE VOLTAGE
- TRANSMISSION LINE NUMBER
- △ DISTRIBUTION LINE NUMBER
- PROPOSED EXTENSION LINE LETTER
- DISTRIBUTION LINE VOLTAGE
- GENERATOR
- SUB-SUBSTATION
- METER
- METER METER
- NOTE: ALL DISTRIBUTION LINES, METER, METER & ALL TRANSMISSION LINES, THESE DATA UNLESS
- PROSPECTIVE CUSTOMERS
- OWNER #
- INDUSTRY #
- INTERESTED OWNER #
- SCHOOL #
- CHURCH #
- SERVICE STATION #

## RURAL ELECTRIFICATION SURVEY DATA SCOTT COUNTY

IOWA STATE PLANNING BOARD  
THE COMMITTEE ON  
PUBLIC SERVICE  
PROJECT 1052



## RURAL ELECTRIFICATION SURVEY

It is the purpose of this survey to (1) obtain information relative to present rural electric service and (2) appraise the possibilities of supplying electric service to additional rural customers.

### Method of Procedure

The field data were collected in the following ten counties: Benton, Davis, Fayette, Madison, Mitchell, Scott, Shelby, Sioux, Story, and Webster. These ten counties were originally selected for the Farm Housing Survey as being typical of the various sections of the state; considerable information secured in this previous survey has been of value in the present survey.

Since May 14 the engineers employed in the field have traveled the roads of these counties locating all transmission and distribution lines, locating all farmsteads, school houses, etc., making major road corrections, correcting city limits in several instances, collecting information on rates and policies, collecting data on the yearly K. W. H. consumption for the customers on rural distribution lines whenever this information could be secured from the utilities, and conducting the engineer's survey of village and town housing.

Since completing the field work these men have been preparing reports, tabulating data, studying feasible extensions, and preparing two sets each of county and township maps of all existing power lines and proposed extensions.

In addition to the field and mapping work, there has also been carried on a research study of the rural electrification problems in Iowa:

the present rate situation and its effect on rural electrification, and methods by which farmers can secure cheaper and more reliable electric service and by which rural electrification can be increased on Iowa farms. The data have been taken from the Farm Housing and Rural Electrification Surveys, from available reports and bulletins, and from correspondence with utilities and state commissions.

#### Work Completed

As a result of this field work a complete record of the transmission and distribution lines of these ten counties has been obtained. The utilities, the Railroad Commission, and the telephone companies have maps of the power lines; but a check between their maps and the ones prepared under the present project reveal inaccuracy and incompleteness in the former.

The survey maps also exhibit extensions which appear to be feasible after a consideration of the following factors: total prospects per mile, farm owners per mile, interested owners per mile, prospective villages or towns, and general conditions of the territory and of the farms. (See Figure 1052-1)

The miles of existing power line in these counties varied from 49 miles in Davis County to 435 miles in Webster County. The miles of feasible extensions proposed after considering the above factors varied from 51 miles in Webster County to 282 miles in Madison County, with the prospects per mile of extension varying from 3.05 in Benton County to 4.83 in Scott County.

The township maps prepared this year from the latest available information on farmstead and road location were used as field maps in

this survey. On these maps it was necessary to make approximately 1050 corrections on location of farmsteads, schools, etc., in Scott County, 950 in Story County, 700 in Davis County, and similar corrections for the other counties. In addition to these, many corrections in road location were made and in some instances city limits were corrected. It appears that field work similar to that which has been done by the electrification survey engineers will be necessary before any very accurate set of township maps will be possible.

On the Village and Town Housing Survey the engineers completed 359 schedules in 53 villages and towns in the ten counties. These data have been tabulated and when analyzed will provide valuable information on the general condition of homes in villages and towns, besides furnishing material for studying comparative conditions of the farm homes and of homes in the communities of the same counties.

This report is accompanied by a completed rural electrification survey report of Scott County. (Report filed with the Planning Board) While this county has been developed more than many other counties, the survey reveals that there is still a possibility of 120 miles of feasible extensions averaging 4.83 prospects per mile. Scott County was therefore considered typical.

The research work shows that, while a few public utilities have spent considerable time and money in an effort to develop a profitable rural load, the farmers themselves have been the real pioneers in Iowa rural electrification. Most of the early lines surveyed have been built and operated by groups of farmers. Rural electrification has increased very

rapidly in Iowa under adverse farm conditions and with very little encouragement or help from electric utilities in recent years.

Available data on rural electric rates, line ownership, extension policies and the cost per month and per kilowatt-hour of energy for three different rates of consumption, and adjusted for different rates and line ownership policies, reveal a chaotic condition in Iowa. Apparently the Iowa Board of Railroad Commissioners must be given more positive and effective control of both urban and rural electric distribution, with power to require uniform accounting methods and a uniform rate basis. A study has been made of the cost of different types of rural distribution lines and of the effect of these differences on the investment charges per mile and per consumer.

The data on rural electric power conditions and consumption, as secured in the ten counties covered by the engineers of this survey, have been analyzed to determine the relative importance of the different types of farm and non-farm rural consumption in building up rural loads and in making proposed extensions.

A study has been made of the cost of farmstead wiring, the average farm investment in wiring and appliances, and the connected load, maximum demand, and average monthly consumption of different types of farms.

#### Plans for the Next Six Months

Selecting the ten isolated counties covered by the Farm Housing Survey made it possible to use the electrification engineers on the Village and Town Housing Survey and to combine the pertinent information from both studies.



However, the study of feasible extensions was handicapped considerably by being limited to small areas. If such a study were made in a selected group of counties where the possibilities of extensions appear to be the best, most of the disadvantages of limited area would be eliminated. Feasible extensions could continue from one county to the next, and existing lines in adjacent counties could be studied in connection with these proposed extensions.

We have proposed a group of 27 additional counties which tie in six of the ten original counties surveyed making a total area comprising 33 counties. This area was selected by studying density of population, density of farms, per cent of owner-operated farms, land and building values, and general conditions of the territory and present power lines. This group of counties was then divided into three areas, such that after the first area was completed the next two areas would enlarge this central area.

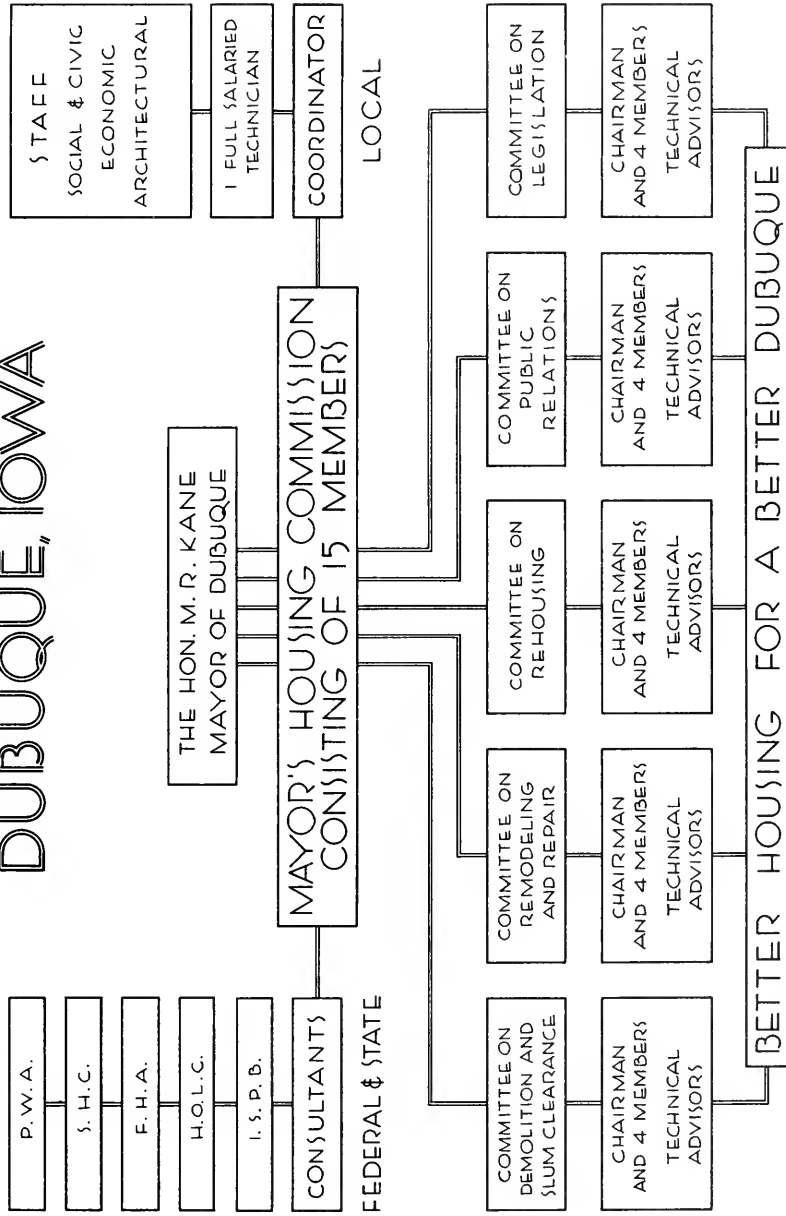
The proposed group of counties will furnish a good central area for working out a systematic program of rural electrification. Surrounding areas could be tied in as desired.

The field data on home ownership and number of farms using electricity, available for the counties included in the Farm Housing Survey, will have to be secured in some other way in the proposed extension area. The necessary information can be secured through the cooperation of the county agents, the corn-hog contract committees or other agencies, with perhaps a small amount of actual farm contact while collecting the rural electrification field data.

Further research is necessary to work out the cheapest and most efficient methods of rural electric distribution, and of equitable rates based on such methods. New methods of wiring must be studied to see if the cost can be cut without sacrificing safety or appearance. Farm uses of electric power will be separated according to primary and secondary importance, and these two classifications applied in detail to typical dairy, livestock, cash grain, diversified or general, poultry, and other types of farms to determine the cost of electric power per unit of production and to show the economy and convenience of electric power. Data will be prepared covering the newer uses of rural electric power, such as household and dairy refrigeration, combating insect pests, soil heating and sterilization, electric stimulation of plant and animal growth, and so on.

The field data as to the feasibility of rural line extensions will be analyzed to determine the factors governing such extensions and the proper weighting of each size and type of farm and other rural consumer. In cooperation with the Extension Department of Iowa State College, plans can be made and material prepared for presenting such information to Iowa farms.

# THE MAYOR'S HOUSING COMMISSION DUBUQUE, IOWA



PUBLIC WORKS

Project 1053

PLANNING BOARD COMMITTEE

P. F. Hopkins, Chairman, Chief Engineer of P. W. A., Des Moines  
George Keller, Chief Engineer of F. E. R. A., Des Moines  
William Woodcock, Chairman of Board of Conservation, Spencer

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PROJECT SUPERVISOR

P. F. Hopkins, Chief Engineer of P. W. A., Des Moines

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TECHNICAL ADVISERS

T. R. Agg, Dean of Engineering, I. S. C., Ames  
O. W. Crowley, Director of Research, Des Moines  
Claire Currie, Webster City -- Howard Green, Cedar Rapids  
A. H. Fuller, Professor of Economics, I. S. C., Ames  
M. L. Hutton, Chief Engineer of Board of Conservation, Des Moines  
O. R. Sweeney, Professor of Chemistry, I. S. C., Ames  
A. H. Wieters, Department of Public Health, Des Moines  
C. C. Williams, Dean of Engineering College, S. U. I., Iowa City

COORDINATOR

George Davis, I. S. C., Ames

PRELIMINARY REPORT ON FEDERAL, STATE AND  
LOCAL PUBLIC WORKS NEEDED IN IOWA

This preliminary report on the needs for public works in Iowa is necessarily very incomplete, because of the brief time and limited services at the disposal of the committee. The opinions of many public officials and others have been obtained concerning the various projects which should be undertaken in order that each community and the state as a whole may realize the greatest benefits in proportion to the involved expenditure of money and labor. Yet these data constitute only a small part of the great mass which should be collected, analyzed, and evaluated in formulating any comprehensive plan for public works in the state.

SOURCES OF DATA

The data presented in this report were obtained from the following sources:

- (1) General recommendations submitted by Project and Sub-project Supervisors of the State Planning Board;
- (2) Questionnaires sent to all town and city Mayors, County Engineers, and County Superintendents of Schools;
- (3) Correspondence concerning P.W.A. grants for public works, from the files of P. F. Hopkins, State Engineer, P.W.A. for Iowa, and Chairman of this committee;
- (4) An estimate of (a) the total cost of new school buildings which should be built during the next ten-year period and (b) the total cost of maintenance of present buildings during that period; these estimates submitted by R. C. Williams, of the State Department of Public Instruction, and Sub-

project Supervisor of the Planning Board project, "Rural and Adult Education Survey";

(5) A partial list of essential construction projects at some of the principal cities, compiled by the City Engineers at the request of O. W. Crowley, Executive Secretary of the Central Branch, Associated General Contractors. This list was compiled in May, 1933, prior to the passage of the National Recovery Act.

(6) A list of sewage disposal plants which must be constructed if Iowa streams are to be freed from pollution; compiled by A. H. Wieters, of the Department of Public Health, and Supervisor of the project, "Health Survey", of the State Planning Board;

(7) A list of the needs of 373 towns and cities, collected by field workers of the Planning Board project, "Zoning and City and Regional Planning", under the directions of Project Supervisor J. R. Fitzsimmons.

(8) Recommendations for major improvements needed at the several state institutions, from H. J. Liebke, Architect of the State Board of Control;

(9) Estimations of construction needed on the primary and secondary road systems of the state during the ten-year period 1935-1944, submitted by the Committee on Transportation;

(10) A recommendation concerning the proposed Boone County Recreational Reserve, from a report prepared by the Iowa State Planning Board for L. R. Schoenmann, Regional Director for the Land Policy Section of the Agricultural Adjustment Administration;

(11) A list of proposed Iowa National Forests submitted by G. B. MacDonald, Project Supervisor of the Planning Board project, "Forests and

Waste Land".

#### GENERAL PROJECTS

Many valuable ideas and recommendations were submitted by Project and Sub-project Supervisors of the Planning Board. Following is a list of the various general projects, each recommended by one or more individuals as being of great importance in the development of the state.

##### Sanitation:

Construction, improvement, and extension of water systems in many small towns.

Adequate water supply for south central Iowa.

Sewage purification and disposal plants.

##### Education:

Construction of many new school buildings, particularly rural schools, and a large amount of repair of existing buildings.

##### Homes:

Better housing facilities.

Establishment of garden homes.

Rehabilitation of mining towns.

Fire protection.

##### Lakes and Rivers:

Lake development, restoration and protection.

Continuation of the artificial lake program as set forth in the Twenty-five Year Conservation Plan, with especial reference to southwestern Iowa.

Structures for flood control.

Stream improvement for navigation and for erosion control.

Dams, including low-head structures, especially below power dams, to stabilize water depths and preserve fish life and recreational facilities.

Establishment of state right and ownership to lands around lakes and especially along the Missouri and Mississippi Rivers.

Gauging of streams.

#### Conservation:

Use of marginal and other lands for wild life conservation, parks, forests, and lakes.

Development, expansion and preservation of wooded areas.

Protection of wild life.

Erosion control. Aid of individual land owners in controlling erosion.

(Other projects listed under "Lakes and Rivers")

#### Roads and Streets:

Paving and improvement of many roads throughout state, particularly secondary roads.

Improvement in design of streets.

#### Electrification:

Construction of power plants.

Extension of many high-tension electric lines, to provide rural service where not at present available.

#### Recreation, Beautification:

Establishment of town and city parks.

Beautification of towns.



These recommendations for public works are general in nature. They represent some important major lines of development along which the state must proceed if it is to insure healthful and sanitary living conditions, effective education of children, conservation and development of the beauty and usefulness of lakes, rivers, and forests, preservation of wild life, control of floods and erosion, and the availability of good roads, of recreational facilities, and of electricity for light and power.

#### LOCAL NEEDS

Practically, general needs for public works can be considered only as aggregates of many particular local needs. The needs of 428 cities, towns, and rural districts have been tabulated, with an estimate of the cost of each project.

In many cases where costs were not given, rough estimates have been made, based upon the population of the town or city and the average cost per capita as indicated by the costs of similar projects elsewhere in this state. These estimates are for water systems, sanitary sewers, sewage disposal plants, electric power plants, parks, playgrounds, and swimming pools. While many individual estimates may be considerably in error, the average (and hence the total) of all estimates should be roughly correct.

A considerable number of public works which were recommended were not included in the list because unaccompanied by estimates of cost or because of uncertainty of designation of the projects.

Following is a summary of totals of estimated costs for each county. This summary is not to be taken as representing the actual county-to-county

variation of total costs of all public works needed, but only as a convenient summary of the needs concerning which we have recommendations and some essential data.

Summary of Totals of Estimated Costs  
of Needed Local Public Works, by Counties

(Incomplete, representing only information received to date)

<u>County</u>	<u>New Works</u>	<u>Repairs and</u> <u>Alterations</u>
Adair	\$ 20,500	
Adams	10,000	
Allamakee	260,000	\$ 13,500
Appanoose	89,000	2,250
Audubon	102,200	
Benton	408,700	
Black Hawk	2,191,000	151,500
Boone	192,000	
Bremer	3,500	1,600
Buchanan	224,000	
Buena Vista	16,500	
Butler	188,300	
Calhoun	98,400	
Carroll	42,300	300
Cass	384,000	22,000
Cedar	5,600	7,000
Cerro Gordo	1,196,000	125,200
Cherokee	283,700	
Chickasaw	76,000	
Clarke	67,000	1,000
Clay	50,000	
Clayton	135,500	3,000
Clinton	92,000	
Crawford	93,000	
Dallas	153,300	
Davis	55,000	
Decatur	60,450	
Delaware	143,550	450
Des Moines	71,000	
Dickinson	7,500	
Dubuque	1,102,000	133,600
Emmet	72,000	1,100
Fayette	188,000	
Floyd	196,100	65,000

<u>County</u>	<u>New Works</u>	<u>Repairs and Alterations</u>
Franklin	\$125,550	\$ 800
Fremont	141,000	
Greene	50,000	35,000
Grundy	155,800	2,500
Guthrie	34,900	1,000
Hamilton	80,600	
Hancock	49,600	
Hardin	282,200	4,000
Harrison	86,000	
Henry		200
Howard	68,000	
Humboldt	109,200	1,450
Ida	20,600	
Iowa	36,500	
Jackson	60,000	1,500
Jasper	132,800	1,000
Jefferson	108,000	5,000
Johnson		
Jones	116,000	
Keokuk	145,500	
Kossuth	103,400	3,000
Lee	2,592,000	3,000
Linn	69,000	
Louisa	98,500	
Lucas	118,000	
Lyon	25,000	
Madison	35,700	
Mahaska	191,000	
Marion	337,000	101,000
Marshall	374,000	
Mills	194,800	2,400
Mitchell	56,750	
Monona	83,000	100,000
Monroe	31,600	
Montgomery	100,000	
Muscatine	95,000	
O'Brien	115,000	1,300
Osceola	30,200	500
Page	260,500	
Palo Alto	62,200	
Plymouth	61,000	
Pocahontas	77,700	8,700
Polk	4,801,750	68,000
Pottawattamie	2,000,300	950
Poweshiek	18,000	
Ringgold	53,500	
Sac	50,000	5,000

● P L A N N I N G      A      B E T T E R      I O W A      ●

<u>County</u>	<u>New Works</u>	<u>Repairs and Alterations</u>
Scott	\$1,110,170	\$ 1,120
Shelby	123,450	3,000
Sioux	110,000	500
Story	25,400	10,600
Tama	206,000	27,500
Taylor	196,100	4,925
Union		1,300
Van Buren	123,500	4,700
Wapello	510,000	
Warren	87,800	
Washington	210,900	4,000
Wayne	161,800	
Webster	525,650	
Winnebago	132,800	100
Winneshiek	40,100	
Woodbury	5,886,800	22,000
Worth	37,550	
Wright	265,700	1,200
Totals	\$31,868,970	\$954,745

These data also are given below in the form of a summary of totals of estimated costs grouped by kinds of projects.

Summary of Totals of Estimated Costs  
of Needed Local Public Works, by Projects

<u>Project</u>	<u>New Works</u>	<u>Repairs and Alterations</u>
Schools	\$1,739,170	\$252,650
Municipal Buildings	1,260,300	105,920
Electric Plants and Distribution	1,824,000	45,500
Water Works	2,455,450	21,250
County Projects		
Court House	125,000	20,000
County Home	30,000	
County Poor		500
Bridges and Culverts	766,500	
Drainage ditches		100,000
Sanitary Sewer Systems	13,825,400	55,900
Streets	4,684,950	254,675
Parks, Playgrounds, Athletic Fields	321,350	58,800

<u>Project</u>	<u>New Works</u>	<u>Repairs and Alterations</u>
Swimming Pools	\$725,000	\$ 5,700
Flood Control	3,264,300	
Waterfront Improvements	182,500	2,000
Airports	107,500	
Cemeteries	2,550	2,600
Miscellaneous	<u>555,000</u>	<u>29,250</u>
Totals	\$31,868,970	\$954,745

These figures probably vary from one kind of project to another approximately as we should expect them to vary when it has been possible to investigate the local needs of the entire state. Thus far, the figures indicate that Iowa needs to spend much more for sanitary sewers and disposal plants than for any other local public work. The construction and improvement of streets, flood control, water works, electric plants and distributing systems, schools and municipal buildings, follow in descending order of total expenditures which should be made.

#### SCHOOLS

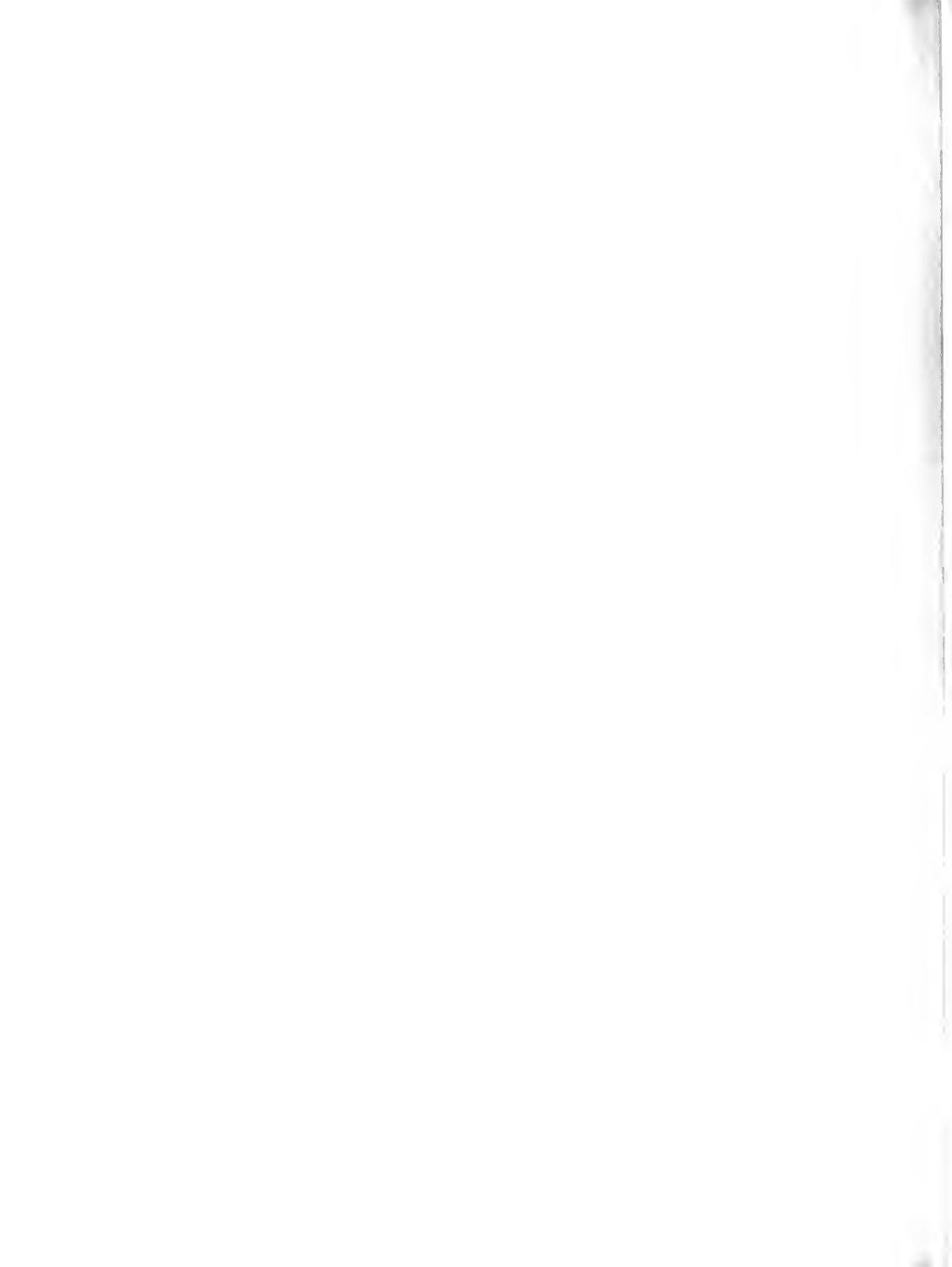
Iowa is in need of a large number of new school buildings and repairs on existing structures. It is not possible at present to list more than a few of these needs individually. However, an estimate of the total expenditures which this state should make for buildings and maintenance during the next ten-year period has been submitted by R. C. Williams, of the State Department of Public Instruction. The figures are based on general knowledge and facts obtained from the files of the Department of Public Instruction. The estimate is as follows:

SCHOOL CONSTRUCTION

Fig. 1053-1

This map shows the trend in expenditures for school buildings and grounds between 1923 and 1932. It indicates a sharp decrease in school expenditures between 1930 and 1932 for the state as a whole. The average expenditures had been rising up to that time.







Estimated Outlay for School Buildings  
in Iowa for the Period 1935-1944

	<u>New</u> <u>Buildings</u>	<u>Maintenance</u> <u>of Present</u> <u>Buildings</u>	<u>Total</u>
City, town, village and consolidated districts	\$39,720,000	\$11,889,500	\$51,609,500
School townships and rural indepen- dent districts	<u>7,425,000</u>	<u>5,445,000</u>	<u>12,870,000</u>
Total	\$47,145,000	\$17,334,500	\$64,479,500

STATE INSTITUTIONS

Recommendations for major improvements at our fifteen state institutions have been submitted by H. J. Liebbe, Architect of the Board of Control of State Institutions. According to Mr. Liebbe, the buildings are overcrowded, with patients sleeping on the floor. Needs for repair and maintenance work have never been adequately met since the time of the World War.

The list of needed improvements follows. It is entirely free of contingent and repair requirements, which are very important since "the majority of our buildings are extremely old and demand close inspection and constant repairing".

NEEDED IMPROVEMENTS AT STATE INSTITUTIONS

Custodial Building for Insane, Mount Pleasant State Hospital	\$175,000
Custodial Building for Insane, Clarinda State Hospital	175,000

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Custodial Building for Criminal Insane, Mount Pleasant State Hospital	\$170,000
Two Custodial Buildings for Feeble-minded, Woodward State Hospital	320,000
Hospital Building for Tuberculars, State Sanatorium, Oakdale	125,000
Hospital Building, Women's Reformatory, Rockwell City	60,000
Hospital Building, Men's Reformatory, Anamosa	75,000
Kitchen and Congregate Dining Room, including Store Room Section, Cold Storage Plant, Preparation Section, etc., Clarinda State Hospital	160,000
New Power House and Equipment, Clarinda State Hospital	180,000
School Building, Girls' Training School, Mitchellville	40,000
Power House Alteration, Iowa Soldiers' Home, Marshalltown	50,000
Power House Alteration, Training School for Boys, Eldora	25,000
Two Cottages and Equipment for Children, Juvenile Home, Toledo	45,000
Electrical Changeover, Glenwood State Hospital	100,000
Electrical Changeover, Independence State Hospital	50,000
Disposal Plant, Woodward State Hospital	35,000
Disposal Plant, Men's Reformatory, Anamosa	25,000

Dormitory for Children, Soldiers' Orphans' Home, Davenport	<u>\$30,000</u>
Total	<u>\$1,840,000</u>

# ROADS

The Committee on Transportation, of which Fred R. White is Chairman and Project Supervisor and W. O. Price Sub-project Supervisor, has submitted estimates of the construction needed on our primary and secondary road systems during the ten-year period, 1935-1944. These estimates are as follows:

## Estimated Needed Construction on Primary Road System for the Ten-year Period 1935-1944

Completion of paving on bond issue system, with necessary regrading and drainage structures	\$22,500,000
Grading, draining, and surfacing of ungraded portions of present system 400 miles	4,000,000
Grading, draining, and surfacing of connections to towns of 150 population (not now served) and to newly developed State Parks	2,000,000
Railroad crossing grade separations on present system	15,000,000
Replacement of inadequate drainage structures on present system	5,000,000
Construction of additional trunk roads to shorten distance between principal cities	50,000,000
Reconstruction of city routes or construction of by-pass routes for primary road traffic	20,000,000
Resurfacing of existing gravelled roads, with dustless and more adequate surface - 2,400 miles	12,000,000
Reconstruction of existing pavement as required by needs of traffic	<u>21,000,000</u>
Total	<u>\$151,500,000</u>

Estimated Needed Construction on  
Secondary Highways for the Ten-year Period 1935-1944

Grading, draining, and surfacing of remaining portion of county trunk system	\$14,000,000
Surfacing of part of county trunk road system with bituminous surface or equivalent	15,000,000
Grading draining and surfacing part of local road system	40,000,000
Railroad crossing improvement	<u>5,000,000</u>
Total	<u>\$74,000,000</u>

NATIONAL FORESTS AND BOONE COUNTY RECREATIONAL RESERVE

Forest Reserves:

A list of proposed national forests in 43 counties has been submitted by G. B. MacDonald, Project Supervisor of the Planning Board project, "Forests and Waste Land". Estimates of cost of land and developments have not yet been made. The list of forest areas is as follows:

Proposed Iowa National Forest Purchase Areas

(For counties only which have been covered in the  
Forest and Wasteland Survey)

COUNTY	Number of units	Total acres gross	Estimated private land within area, not included	Total net acres for National Forest
Adair	1	960	192	768
Adams	2	3200	640	2560
Allamakee	5	107520	21504	86016
Appanoose	6	97440	19488	77952
Boone	1	52440	10488	41952
Clarke	3	63360	12672	50688
Clay	3	5600	1120	4480
Clinton	7	19840	3968	15872
Davis	3	132480	26496	105984
Decatur	4	149760	29952	119808
Des Moines	3	5312	1063	4249

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COUNTY	Number of units	Total acres gross	Estimated private land within area, not included	Total net acres for National Forest
Dickinson	5	9936	1987	7949
Dubuque	12	38080	7616	30464
Emmet	8	6880	1376	5504
Fayette	7	17920	3584	14336
Fremont	4	39200	7840	31360
Guthrie	12	26280	5256	21024
Harrison	10	56320	11264	45056
Humboldt	1	2720	544	2176
Jackson	3	13760	2752	11008
Jefferson	4	1952	391	1561
Johnson	4	30400	6080	24320
Kossuth	4	10560	2112	8448
Lee	4	69600	13920	55680
Linn	8	39840	7968	31872
Louisa	11	44160	8832	35328
Lucas	3	58880	11776	47104
Monona	8	70500	14100	56400
Monroe	4	91520	18304	73216
Montgomery	2	2720	544	2176
Muscatine	4	35680	7136	28544
Page	3	4600	920	3680
Palo Alto	1	640	128	512
Plymouth	1	25920	5184	20736
Ringgold	7	21600	4320	17280
Scott	5	11808	2362	9446
Taylor	1	1440	288	1152
Union	3	43200	8640	34560
Van Buren	9	77120	15424	61696
Wapello	3	36800	7360	29440
Wayne	4	18240	3648	14592
Webster	2	52000	10400	41600
Winneshiek	6	56640	11328	45312
Totals	1654828	330967	1323861	

Boone County Recreational Reserve:

In the report for the proposed Boone County Recreational Reserve, prepared for L. R. Schoenmann, Regional Director for the Land Policy Section, Agricultural Adjustment Administration, a lake with an area of approximately

70 acres is proposed. This lake would be created in the valley of Bluff Creek. Such a development is favored for the purpose of supplying fish to the upper river and encouraging wild life in the vicinity. An estimate of the cost of the project is not yet available.

It was suggested that the development be made possible by either the State Fish and Game Commission or by national agencies.

#### GAME REFUGES AND RECREATIONAL AREAS

The Committee on the Planning Board project, "Fish and Game", of which I. T. Bode, State Fish and Game Warden, is Project Supervisor, has submitted recommendations for the acquisition of lands for game refuges, waterfowl breeding areas, public shooting grounds and recreational areas. These lands are located principally in the northwestern part of the state and along the larger rivers. The survey and classification of Iowa waters and the resulting recommended uses as determined by the Iowa Fish and Game Commission, has emphasized the urgent need for additional lands surrounding these water areas. The development of these lands would constitute an important part of the public works involved.

The lands are of the extents and locations shown in the following list:

<u>County</u>	<u>Acres of land</u>	<u>County</u>	<u>Acres of land</u>
Adams	40	Calhoun	80
Allamakee	100	Cass	120
Appanoose	675	Cerro Gordo	836
Bremer	200	Clarke	275
Buchanan	600	Clay	5616
Buena Vista	320	Clinton	100

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<u>County</u>	<u>Acres of land</u>	<u>County</u>	<u>Acres of land</u>
Crawford	40	Mills	5300
Davis	1225	Mitchell	250
Decatur	2028	Monona	48640
Delaware	200	Monroe	143
Des Moines	60	Montgomery	140
Dickinson	1565	Muscatine	3325
Emmet	2660	Osceola	160
Fairfield	122	Page	50
Fremont	5305	Palo Alto	1374
Greene	40	Pocahontas	1482
Hamilton	1460	Polk	1318
Hancock	720	Pottawattamie	300
Harrison	8230	Poweshiek	50
Henry	80	Ringgold	60
Humboldt	1300	Sac	1490
Iowa	500	Tama	100
Johnson	260	Taylor	178
Keokuk	39	Union	275
Kossuth	4640	Warren	200
Lee	7600	Washington	7
Linn	150	Wayne	567
Louisa	6950	Winnebago	1200
Lucas	298	Woodbury	340
Mahaska	21	Worth	180
Marshall	250	Wright	220
Total acres		122054	

In the selection of these lands a scale of \$20 to \$30 an acre has been tentatively established. The higher priced lands were avoided if possible. Estimates of costs of development have not yet been made.

#### PROPOSED METHOD OF PROCEDURE

#### FOR THE NEXT SIX MONTHS' PERIOD

In our work on the Public Works Project to date, the general plan which has been followed has been to obtain information from all available sources on the needs of the state for public works. This has been done by written correspondence and by personal interviews with persons who have

personal knowledge of conditions or who have obtained information through their work on the Iowa State Planning Board or otherwise. It has not been possible without a staff of field workers to attempt a first-hand personal survey of the state.

It is proposed that the general plan of procedure during the next six months be similar to the plan followed to date, involving the following details of method:

- (1) A follow-up appeal to each Mayor, County Engineer, and County Superintendent of Schools who has not yet responded, to return the Public Works questionnaire with complete and accurate information. This should bring in several hundred reliable reports on local needs.
  - (2) Sending similar questionnaires, with explanatory letters, to city and town Superintendents of Schools.
  - (3) A personal or written request that each Project Supervisor, Coordinator, or other official of the State Planning Board submit any information which he may obtain on needed local, state, or federal public works.
  - (4) Similar requests for information from state officials who are in position to learn of needs for public works.
  - (5) Requests for information delivered by radio broadcast from "W. O. I." at Iowa State College.
  - (6) A personal visit to the location of any important proposed works, to obtain or confirm information, if circumstances seem to justify the visit.
  - (7) Correlation, classification, and tabulation of all data received.
- Procedure No. 5 is proposed as a very effective means of obtaining



information. It has the very great advantage of reaching many highly intelligent and public spirited citizens who hold no public offices and so would not be reached by questionnaires and other written communications addressed to officials. Included in the list of those reached by radio are a great many women who are not ordinarily reached but who may have many valuable suggestions to submit. We believe that it is very important to obtain the opinions of as many private citizens as possible, particularly in the absence of a personal survey by highly qualified field workers. It should be easily possible to word a radio request in such manner as to elicit the most useful type of response. The request could be repeated at different times of day and at intervals of a few days, thus reaching a large number of listeners.

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